

AFIT/GLM/LAL/97S-3

FOREIGN MILITARY SALES SUPPLY SUPPORT:  
IS THERE A BETTER WAY?

THESIS

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### **Abstract**

In today's world of declining defense budgets, there is an increasing need for South Korea to ensure they obtain the best dollar value when procuring defense articles. With the increasing financial situation, the purpose of this thesis is to research a surrogate third party firm and determine to what degree South Korea and other foreign military sales customers obtain the best value for their money for follow-on support item procurements.

South Korea has participated in the Parts and Repair Ordering System program since its inception. However, South Korea has received little, if any, feedback regarding lead time and cost performance from the Air Force Security Assistance Command. This study analyzed two variables, lead time and total unit cost, and compared these variables in two procurement systems to discover which one provides the best lead time performance for the total average unit price. The results of this analysis concluded that our surrogate third party firm was faster, though not significantly; however, this came at a high price for follow-on support item procurement.

## **FOREIGN MILITARY SALES SUPPLY SUPPORT:**

### **IS THERE A BETTER WAY?**

#### **I. Introduction**

##### **Background**

Today, military events are changing rapidly, thus requiring the Department of Defense (DoD) and commercial industry to change the way that Foreign Military Sales (FMS) are conducted. These changes are the result of the decreasing U.S. military budget. Also, the defense budget of Korea, a major FMS customer, is decreasing while FMS costs are increasing.

Acquisition reform affects FMS follow-on support through Outsourcing and Privatization (O&P) and Commercial off the Shelf (COTS) buying initiatives within the DoD and the United States Air Force (Air Force). With the growth of third-party logistics providers and our defense industry contracting out commercial support for weapon systems, FMS follow-on support will somehow be affected in the future.

##### **Security Assistance**

The primary method the United States Government (USG) uses to carry out foreign and national policy is Security Assistance (SA). The Department of Defense defines SA as follows:

Groups of programs authorized by the Foreign Assistance Act of 1961, as amended, and the Arms Export Control Act of 1976, as amended, and other related statutes by which the United States provides defense articles, military

training, and other defense related services, by grant, loan, credit, or cash sales in furtherance of national policies and objectives. (Defense, 1994:37)

There are seven programs that make up SA: 1) Foreign Military Sales, 2) Foreign Military Financing Program, 3) Military Assistance Program, 4) Direct Commercial Sales Licensed under the Arms Export Control Act, 5) International Military Education and Training Program, 6) Economic Support Fund, and 7) Peacekeeping Operations. These programs vary from military to economic assistance programs.

Again, the overall American SA program consists of seven elements with FMS being the largest program element. SA helps strengthen the national security of friendly nations, support prospective democratic institutions, and market economies (Defense, 1994:5). FMS contributes to the U.S.'s financial, political, and military elements of national defense through political leverage to foreign policy decision making and coalition building to the military. SA has and always will remain an important tool the USG uses to implement foreign and national policy.

This study will center on the process of providing logistics follow-on support to friendly foreign countries (i.e. South Korea) with the main focus being: FMS.

### **Foreign Military Sales**

FMS is the largest component of the U.S. security assistance program. FMS is the process through which eligible foreign governments purchase defense articles, services, and training from the USG, as amended by the Armed Export Control Act (AECA) (DISAM, 1981:1-2). This act, as well as the Anti-Deficiency Act, prohibits the use of appropriated funds for FMS. Therefore, the USG expenses are passed onto foreign

countries, which, in turn, pay a surcharge for all associated services. FMS allows a foreign country to procure items for weapon systems logistics follow-on support.

### **FMS Weapon Systems Logistics Follow-on Support**

Once a foreign government purchases a weapon system, follow-on support arrangements must be made. Without logistics follow-on support a weapon system will become inoperable. To avoid this dilemma, follow-on support procedures must be developed so needed repair parts can be purchased and existing systems can be modified.

Follow-on support for foreign military sales within the Air Force is maintained by the Air Force Security Assistance Command (AFSAC). AFSAC manages all FMS follow-on support, which is provided by Air Force Materiel Command (AFMC) and Air Logistics Centers (ALCs).

The FMS program, specifically within the AF, is designed so customers can arrange logistics follow-on support and deal with only one agency, AFSAC. Though foreign countries can use the FMS program as a method of follow-on support, they are not bound to it. FMS customers have other available options for logistics follow-on support.

### **Third Party Logistics Firm**

Third party logistics firms are companies that have the capability to provide some or all logistics functions for other firms. Third party logistics firms either performs these functions more cost effectively or in a manner that yields increased customer service (Lieb, 1994:34). Services important to FMS customers include transportation, inventory management, and freight forwarding. When dealing with FMS follow-on support, a third

party provider can work for the USG or the FMS customer. In either case, a third party firm performs logistics functions specified by the customer, like transportation, inventory management, or warehousing functions.

### **Outsourcing and Privatization**

What is Outsourcing and Privatization? Outsourcing is the transfer of a commercial function which has been performed in-house to an outside provider. Outsourcing allows the AF to retain all control and responsibility through by overseeing the service contracts and recurring services. Privatizing is the transfer of control and ownership of functions and/or business assets from the public sector to the private sector.

As military missions change and the defense budget shrinks, the AF, specifically, and the DoD are increasing the use of commercial practices, including outsourcing and privatizing. For the past 20 years, the USAF has outsourced and privatized non-combat services across all functional areas (Arana-Barradas, 1997:1). Examples of outsourcing and privatizing within the AF include, but are not limited to:

- 1) base level activities such as training range management, building and grounds maintenance, precision measurement equipment calibration, aircraft maintenance, transportation, and inventory management
- 2) depot maintenance
- 3) military family housing (Department, 1996:5-6).

AF perceived benefits of O&P are similar to those expected in the private sector. Both cost savings and efficiency improvements are cited as potential benefits as a result of contractor competition. While attempting these improvements, the AF must



meet four other challenges: 1) sustain readiness, 2) improve the performance, quality, efficiency and cost effectiveness of AF activities, 3) generate savings for modernization, and 3) focus personnel and resources on core activities to ensure little risk to our fighting forces as a result of reduced procurement budgets (DoD, 1996:2).

AF O&P efforts, along with future changes to industry supported weapon systems, are primary factors that will affect how follow-on support is provided in the future. Currently, under the FMS program, the AF outsources parts procurement and repair through the Parts and Repair Ordering System (PROS) for foreign customers.

PROS needs to be responsive, flexible, and conform to customer requirements. PROS is designed for non-standard item and standard item support via contractors and vendors to support weapon systems and equipment no longer supported by the USAF. Also, PROS, on a limited basis, supports procurement of standard items in the USAF inventory. Procurement lead time is important to the FMS customer and is a critical component of the logistics process. Lead time is the amount of time from order placement to order arrival. If reduced, this element can aid in achieving a certain level of customer satisfaction. Also, reduction in procurement time and lower inventories will minimize associated procurement costs, thus reducing weapon systems costs.

Again, a reduction in procurement lead time will help improve customer service. The length and variance in procurement lead time has a direct impact on inventory investment, demand forecast accuracy, inventory turbulence, safety stock levels, and weapon system responsiveness (Perry, 1990:15). With a reduction in lead time, the FMS customer can possibly save valuable dollars that may be used elsewhere. Today, the USAF manufactures high technological military weapons, which come with a hefty price

tag. With these concepts in mind, PROS was created to reduce procurement lead time at an acceptable cost to the FMS customer. The customer must evaluate the trade-off between procurement lead time and unit cost; however, the customer still requires PROS to provide the best value for the money (Brown, 1993:6).

### **Parts and Repair Ordering System**

Programs such as PROS are important to Korea because they help maintain a strong defense inventory. PROS is managed by the AFSAC. PROS is contracted out to Science Applications International Corporation (SAIC), a third party logistics firm, which provides support for all spares, non-standard items (NSIs), and manages item procurement and shipping. Currently the value of the PROS contract is estimated at \$750 million with a basic performance of two years with three one-year options.

PROS is designed to keep costs as low as possible and to provide a wide range of support options for the FMS customer. Support options include the capability to purchase a wide range of standard and non-standard supply parts and repair services. These are accomplished quickly, efficiently, and at attractive prices. Maintaining a full spectrum of available support controls costs. Also, SAIC provides exceptional support through a low cancellation rate. When SAIC achieves this level of customer service they are awarded a fee from a plan which has been implemented to motivate them to continually perform above and beyond the standards in the statement of work (SOW). PROS charges each FMS customer only for the support provided (SOW,1995).

Again, possible O&P candidates in the logistics area include but are not limited to intermediate and depot level maintenance, wholesale and retail supply, transportation,

and inventory management. Therefore outsourcing and privatizing DoD non-core logistics competencies becomes increasingly important to FMS customers. The changed logistics infrastructure will certainly affect FMS follow-on support. As a result of O&P initiatives, FMS customers will certainly require more follow-on support from programs like PROS not only for AFMC managed items, which are referred to as standard items, but for non-managed AFMC items, which are referred to as non-standard items. This research focuses on the procurement of all items.

Non-Standard Items. NSIs are defined as items or equipment not managed by AFMC or no longer purchased by the Department of Defense. NSIs occur for a number of reasons:

- a) the aircraft is no longer maintained in the DoD's inventory,
- b) a country may change an item depending on its mission needs,
- c) improvements to weapon systems have occurred, or
- d) the item is obsolete.

NSIs can severely impact follow-on support and possibly cripple a country's national defense. Consequently, effective procurement of NSIs is important to our allies.

### **Problem Statement**

With declining budgets and reduced military structures, Korea requires assurance they are receiving the best value for the money in procuring defense related items. Korea must participate in the FMS program to meet their national defense objectives against North Korea. The purpose of this thesis is to compare follow-on support for cost/lead time performance between the AF AFSAC ALC procurement system and a third party

logistics firm when purchasing spare parts. The AF AFSAC PROS procurement system will act as a surrogate third party firm for this study. Therefore, we will examine if using a third party logistics firm provides a more cost effective, more flexible parts acquisition system for the FMS customer.

### **Research Objectives**

The purpose of this research is to discover the value direct contact, without USAF intervention, with a third party firm would add to the Korean Department of Defense. Would using a third party firm provide better support to Korea than using the current AFSAC PROS procurement system for all spares procurement? The variables of concern are:

- a) Total Procurement Lead Time (TPLT), and
- b) Total Unit cost.

### **Research Questions**

- 1) Is there a difference between the average TPLT and average total unit price for all spare items procured under the AF ALC procurement system compared to the surrogate third party firm for all Korean requisitions?
- 2) Is there a difference between the average TPLT and average total unit cost under the AF ALC procurement system compared to the AF PROS procurement system for Korean NSI requisitions?

## **Limitations and Scope**

This study will focus on the procurement of Korean spares and will be limited to DoD programs. Efforts by the Army Nonstandard Acquisition Program (SNAP) and the Defense Logistics Agency Contractor Operated Parts Depot (COPAD) are not of importance for this particular study. This research will analyze the performance of two systems used for procurement of non-standard items. These two systems will be referred to as the AF ALC procurement system and the AF PROS procurement system. The performance of these two systems will be applied to form a surrogate third party logistics firm. Then, this research will analyze the performance of the surrogate third party firm to the AF ALC and AF PROS procurement systems.

The scope of this study is limited to the procurement process of all spares supported through the AF ALC system. Completed procured spares of concern are those that support the Korean Air Force. Finally, this research will not account for problems that occur during contingency operations.

## **Thesis Organization**

This research is organized into five chapters. Chapter I, Introduction, introduces the purpose of this study and the associated problem. Chapter II, Literature Review, will explain the evolution of the USG SA program and the importance of FMS to the Korean Department of Defense. Furthermore, the history of follow-on support for the PROS and program DCS will be discussed. Chapter III, Methodology, details the methodology used to gather information required to conduct this research. Chapter IV, Data Description and Analysis, analyzes the total lead time and costs components of the PROS program and

DCS. Chapter V, Findings and Conclusions, presents the conclusions of the results, a summary of the research, and provides recommendations for further research.

## **II. Literature Review**

### **Introduction**

This chapter will provide background information on the evolution of FMS in the U.S. with a brief outline of South Korea's participation in the FMS program. Next, logistics follow-on support will be fully explained. This will allow for a comparison between FMS and DCS methods of follow-on supply support. A brief description of the FMS supply support process including standard item and nonstandard item support is provided to explain incorporation O&P initiatives into the AF's FMS program. This review will allow the reader a reference to the PROS evolution.

### **Historical Perspective**

Selling military equipment to foreign countries is not new to the USG. In fact, the USG's SA policy can be traced back to our entrance into World War II.

In 1939, Congress revised the Neutrality Act allowing the sale of arms, during peacetime, to the United Kingdom on a cash-and-carry basis. Franklin D. Roosevelt (FDR), in the Destroyers for Bases Deal of 1940, exchanged 50 outdated World War I American navy destroyers to Britain. In turn, Britain leased land to the U.S. (for 99 years), so American military bases could be established (Defense, 1994:13).

FDR's second State of the Union Address, The Four Freedoms, used both of these legislative acts to set the basis for the Lend-Lease Act. The Four Freedoms speech called upon Congress to appropriate and authorize funds to counter our enemies. These funds

were set aside for manufacturing additional munitions and war supplies of many kinds for nations which are in actual wars, with aggressor nations (Roosevelt, 1941).

Later that year, the Lend-Lease Act (1941) was passed by Congress. The Lend-Lease Act provided legal means for the United States to subsidize its allies during WW II. This act allowed the President of the U.S. to authorize the manufacturing of defense articles and to “sell, transfer title to, exchange, lease, lend, or otherwise dispose of” any article to any country whose defense was vital to the United States (Kimball, 1969:133). Appropriations of funds were retained by Congress, however, the President decided repayment terms.

After 1946, it became evident that capitalist and communist ideologies were incompatible and counteractive competition began. The USSR attempted to control Europe as much as possible. This control was initially exerted on Greece and Turkey. In response, Harry S. Truman created The Truman Doctrine which set the ground work for the United States’ own foreign policy and national security. This doctrine established “containment” of Soviet power as opposed to the American “cooperation” policy established by FDR (Truman, 1997).

### **Current Perspective**

Military weapon sales are legislated by the Foreign Assistance Act of 1961, as amended and the Arms Export Control Act of 1976, as amended. The former provides the President with the legal authority to provide military assistance, financial and otherwise, to foreign nations. The latter authorizes him to sell weapons straight from the DoD inventory (Pineo and Lumpe, 1997). The Arms Export Control Act’s intended



purpose is to authorize foreign military sales to further U.S. security objectives and achieve mutual national defense requirements and objectives.

Around 12 February 1995, President Clinton signed Presidential Decision Directive-34, which set foreign policy by his administration. This policy set forth, “transfers to conventional arms [are] a legitimate instrument of U.S. foreign policy-deserving U.S. government support-when they enable us to help friends and allies deter aggression, promote regional stability, and increase interoperability of U.S. forces and allied forces” (Lumpe, 1995).

The goals of Presidential Decision Directive-34 are:

- a) To ensure that our military forces can continue to enjoy technological advantages over our potential adversaries.
- b) To help allies defend themselves against aggression while promoting interoperability with U.S. forces when combined operations are required.
- c) To promote regional stability in areas critical to U.S. interests, while preventing the proliferation of weapons intended for mass destruction as well as their missile delivery systems.
- d) To promote peaceful conflict resolution and arms control, human rights, democratization, and other U.S. foreign policy objectives.
- e) To enhance the ability of the U.S. defense industrial base to meet U.S. defense requirements and maintain long-term military technological superiority at lower costs.

The premise of these goals is to allow the U.S. to build coalitions and preserve and protect the US industrial base.

### **Coalition Building**

Currently, coalition building is important to U.S. security for three reasons. First, U.S. forces are being reduced, at home and overseas, lessening our forward presence and causing us to be more reliant on US allies to assist in future conflicts. Second, by selling weapons to US allies, the US can influence the allies to 'play by US rules'. Not doing so will result in the US discontinuing logistical and technical support at any time. An example of 'play by our rules' occurred when Iran captured the U.S. embassy in 1979 the U.S. cut-off Hawk missile batteries, F-14 aircraft, and other military systems (Beard, 1995:5). Finally, coalition building provides the U.S. the assurance that allies can fulfill their mission when required. To fulfill their mission, they must be equipped with state-of-the-art, high technological equipment so they are compatible with deployed U.S. forces.

### **Industrial Base**

The U.S. defense budget is decreasing annually and, as a result, so is our industrial base. Foreign military sales creates sales that keep the American industrial base alive. Presently, foreign military sales are keeping the F-15E production line open and after FY97 all F-16 production will be for FMS countries (Beard, 1995:6).

Secretary of Defense William Perry as well as many others feel that the critical skills in the defense industry must be preserved. Since the USG is not purchasing enough

items to support its industrial base the USG must sell to other countries (US allies).

William Perry outlined seven initiatives to maintain our industrial base:

- a) Maintaining our defense technology base.
- b) Procuring defense unique items even if that product is not necessary in the quantities needed by the military forces.
- c) By converting a larger portion of our procurement to dual-use items, we would be able to sustain that portion of the defense industrial base, if we maintained a robust economy, with no special actions on the part of the Defense Department.
- d) Reforming the defense acquisition system in order to sustain our defense industrial base.
- e) Supporting and assisting defense companies in their efforts to diversify.
- f) Reducing the DoD's overhead in bases, depots, and civilian personnel.
- g) Assisting U.S. companies in exporting their products across the world (Perry, 1994:22).

These initiatives aid the DoD in cost effectively acquiring needed depot maintenance while supporting the industrial bases in the public and private sectors. However, the critical issue facing the DoD is how to determine the appropriate size of its industrial base in the post cold war era.

### **Outsourcing and Privatization**

With the end of the cold war and increased reliability, maintainability, and durability of military systems, the need for large depot-level maintenance support is

decreasing (General, 1996:1). In addition, the military is under pressure from the USG to downsize. As a result, attempts to “right size” the industrial base are being made through O&P initiatives, thus maintaining readiness at a sustainable risk.

To ensure the “right size” of the industrial base, legislation acts were passed. These acts established many laws concerning O&P with the importance on the 60/40 workload. Congress then passed a law, 10 U.S.C. 2466, which dictates the amount of depot-level maintenance workload to be performed at public depots at not less than 60 percent, and not more than 40 percent in private industry (General, 1996: 12).

Many of the tasks performed at depots are similar to those accomplished in the private sector. Because of this similarity, many people feel private contractor support should be utilized more. To succeed with increased contractor support, the AF defined its depot maintenance O&P objective as the ability to “maintain or improve support to the warfighter while obtaining the best value for the Air Force”. Then the AF created an O&P program office, which established the AF’s O&P program goals:

- 1) Eliminate duplication and improve performance by doing business more efficiency which will result in cost savings.
- 2) Savings generated from increased efficiencies will be used for modernization.

To achieve these goals military leaders agree that DoD must return to its core competencies, national defense (Haines, 1997).

Before the AF uses O&P, they must first understand their core competencies and ensure O&P initiatives are being utilized for the right reasons. When discussing logistics follow-on support the primary emphasis is to outsource or privatize those functions that

are non-core to the USAF. The AF can realize the full benefits of outsourcing and privatizing those logistics functions which do not negatively affect mission readiness. However, once outsourced or privatized those logistics functions will no doubt be gone forever. Also, in the event of a war or a contingency situation there is not enough time to permit DoD personnel to be trained in time to provide support for that war or contingency. Thus, accurate identification of core competencies is critical and the AF should slowly embrace O&P initiatives until it fully investigates the consequences of relying on third party firms. Therefore, the AF should choose those activities necessary to strike an even balance of cost savings, customer service, and mission readiness (Jones, 1995:20).

Current O&P candidates include transportation, supply (wholesale and retail), and maintenance (intermediate and depot) (DSB, 1996). Due to depot maintenance and O&P initiatives, FMS customers will be affected by the AF logistics infra-structure because it provides FMS follow-on support. Therefore, O&P will require FMS customers to either seek more follow-on support from programs like PROS or look for other third party direct support.

Since the 1970's, FMS nonstandard item follow-on support has been outsourced. Currently, O&P initiatives are being pushed strongly. This, for the most part, is the result of decreasing military size and money. Since a large portion of FMS support is provided by ALCs, it stands to reason that O&P will affect FMS follow-on support. The effect on FMS follow-on support will be partially determined in part by the amount of follow-on support that can be provided organically and how much will be supported through O&P

programs like PROS. Plus, O&P initiatives concurrent with depot privatization will allow other third party companies to enter the follow-on support field.

AF O&P efforts mixed with future changes in industry weapon systems support are primary factors that will affect future FMS follow-on support. With this in mind as well as the idea of depot privatization, increased opportunities for companies to enter the FMS follow-on support field becomes possible. Directly, providing spare parts or part repair to FMS customers certainly is not an AF core competency; however, FMS follow-on support mixed with coalition building indirectly becomes an AF core competency.

#### **FMS Between U.S. and ROK**

A blood-tied relationship between two allies has been maintained since the Korean War began in 1950. It is an increasingly important relationship not only for security interests but also for growing economic reasons. Following the signing of an armistice agreement in 1953, the U.S. provided both military and economic assistance to deter the North Korean threat and protect the stability of the region. This was the beginning of FMS between two allies.

FMS expenditures have increased due to mutual interests, the continued North Korean threat, the need for self-defense, and the Republic of Korea's (ROK) rapid economic growth. The U.S. government also continued FMS to protect its allies against and to develop U.S. national interests. Therefore, FMS expenditures have reached more than \$2 billion between the two allies which made the ROK the third largest FMS purchaser in FY1996. The ROK purchased 16 Lockheed Martin F-16A/B Falcon combat

jets, 46 McDonnell Douglas Harpoon anti-ship missiles, and even 300 night vision goggles due to North Korea's submarine espionage in July 1996 (Arms Sales Monitor, 1997).

U.S. FMS Interests in ROK. Since the Korean War in 1950, most of the ROK military arms and articles have been equipped and maintained from the support of the U.S. through FMS. In supporting U.S defense strategy and regional objectives in the Korean peninsula, the U.S. gains some favorable benefits:

- a) Building strong military allies against enemies and keeping peace and stability of the region.
- b) Retaining access, privileges, and base rights.
- c) Strengthen the U.S. military industrial base and creating jobs.(DISAM, 1982-1983)
- d) Balancing U.S. military budget reduction by increasing FMS.

Due to the destruction of the U.S.S.R and the importance of economic issues to the U.S in recent years, the economic points of view are more important than security, in dealing with FMS. Because of its high economic growth, the ROK is one of the most valuable allies to the U.S.

ROK Interests Through FMS. The North Korean threat forced the ROK to spend large sums of money on military armaments and military construction projects despite the ROK's shrinking defense budget. There are some important factors to build strong military mainly through FMS to the U.S. as shown below.

- a) The need of national security against North Korea's threat and potential invasion possibility.

- b) Modernization of its forces and the need of self-defense capability.
- c) The need of developing its military industry through high technology and co-production.
- d) The need for arms sale country to third world nations.

The ROK has maintained its forces and regional peace by equipping new military arms and articles and FMS is one of the most important factors to build its forces for decades.

### **FMS Follow-on Support**

As previously stated, FMS customers have the option to obtain follow-on support separate from the AF Logistics system, by a third-party logistics firm. Moreover, the policy of the USG states that the DoD will permit a U.S. contractor (third party firm) to support FMS customer requests of follow-on support, otherwise the FMS country may make procurement purchases through FMS (Defense, 1994:127).

The agency, within the AF, responsible for managing FMS customer follow-on logistics support is the AFSAC. AFSAC provides FMS customers a single point of contact to obtain follow-on logistics support. Thus, the FMS program allows FMS customers to obtain follow-on support for weapon systems directly from the DoD.

FMS support encompasses supply support as well as other functions. Supply support maintains consumable and reparable spares. The following is a description of basic requirements for a follow-on supply support program.



## **Supply**

The supply discipline is responsible for furnishing or providing all necessary equipment and supplies to an organization, to perform its assigned mission. As far as FMS supply support is concerned there are two types of follow-on support items: consumable and reparable. Consumables are usually low cost, non-repairable items, and more economically replaced than repaired. Consumables are issued to a FMS customer based on projected needs and are maintained within the organization for immediate support. Repairables are usually high cost items, repairable, and more economical to repair than replace.

Supply Requisitions. Military Standard Requisitioning and Issue Procedures (MILSTRIP) is a uniform method of requisitioning supplies and equipment from a source of supply. These procedures are not only used by FMS customers but by all branches of the military services. MILSTRIP forms, and formats are mandatory to all requisitioners authorized to request supply support from supply distribution systems. They are equally applicable to all AF requisitioning and issue transactions except in extreme cases, which emanate from bases or the equivalent, depots, etc., including foreign countries participating in the foreign military sales and security assistance program grant aid programs (AETC, 1994:3-1). DLA is assigned the responsibility for MILSTRIP and to ensure continuous operation in a uniform manner by all MILSTRIP users.

Air Logistic Center. In the AF, supply points are located at ALCs. The ALCs function is to support the FMS customer's maintenance function where selected repairables are repaired and stored. USAF depots are Ogden Air Logistics Center, Hill AFB, Utah; Oklahoma Air Logistics Center, Tinker AFB, Oklahoma; Sacramento Air

Logistics Center, McClellan AFB, California; San Antonio Air Logistics Center, Kelly AFB, Texas; and Warner Robins Air Logistics Center, Robins AFB, Georgia.

**Table 1. ALC Support for FMS Weapons Systems**

OO-ALC, Ogden Hill AFB, UT	F-16, Landing Gear Components
OC-ALC, Okla. City Tinker AFB, OK	Engines, Instruments, Electronics, E-3, C-135
SM-ALC, Sacramento McClellan AFB, CA	F-111, Electronics
SA-ALC, San Antonio Kelly AFB, TX	T-37, T-38, F-5, Engines, All Out of Inventory Aircraft
WR-ALC, Warner Robins Robins AFB, GA	F-15, C-130, Helicopters

(Wilken, 1996)

Defense Logistics Agency. Defense Logistics Agency (DLA) is responsible for centralized procurement and distribution of consumable items and commodities for all military services and FMS customers. DLA assumes full responsibility for providing supply and logistical support to all military activities and FMS customers who use consumables. Consumable item requisitions, from FMS customers, are sent to AFSAC, who forwards them to DLA.

### **Transportation**

Transportation is a major component of the six basic functions of logistics. Transportation is defined as “the movement or flow of goods from point-of-origin to point-of consumption—and perhaps their return as well” (Lambert and Stock, 1993:15). Transportation is a management activity for the movement of products and includes

activities such as selecting shipment mode; choosing the specific path; and being aware of both domestic and international shipping requirements. Often transportation is the largest cost in the logistics process, therefore, it is a significant component that must be managed efficiently.

Freight forwarders are used extensively for international transportation. A freight forwarder consolidates numerous small shipments from shippers into larger shipments, thus moving items at a lower rate. When involved in international shipping, forwarders provide documentation services, customs requirements, and provide temporary storage, especially for those FMS customers with limited international shipping experience (Moore, 1996).

Transportation and services are written into LOA by the implementing agency. According to the USG policy, FMS customers are obligated for the transportation activity, as much as possible, outside the Continental United States (CONUS). Although the USG will furnish transportation services for items identified in the LOA to the point of delivery, most FMS customers are responsible for transportation from their country to the appropriate contractor. FMS customers are also responsible for the return of reparable items and from the CONUS POE to their country.

In those cases where the DoD is involved in transportation outside the CONUS, the Defense Transportation System (DTS) assumes the responsibility. DTS consists of three components: the U.S. Army's Military Traffic Management Command (MTMC), the U.S. Navy's Military Sealift Command (MSC), and the U.S. Air Forces Air Mobility Command (AMC). MTMC is responsible for land transportation, and common-user ocean terminals within the CONUS and selected overseas locations. MSC is responsible

for all sea transportation. AMC is responsible for air transportation between points in the U.S. and overseas areas, and between and with in overseas areas. Shipments of follow-on support items are necessary and when more than one command has control.

Uniform Materiel Movement and Issue Priority System. To help coordinate and manage the requisitioning, transportation flow, and issue of materiel according to relative importance a standard was established, the Uniform Materiel Movement and Issue Priority System (UMMIPS). UMMIPS insures the most effective management of logistics system resources and provides a foundation for articulating the relative importance of requisitions and material movement transactions using a sequence of two digit numeric codes (01-15), also referred to as priority designators or priority codes (AETC, 1994:3-6). Priority designators are based on two factors that signify the mission of the requisition: a Force Activity Designator (FAD) and a urgency need designator (UND). This allows for maximum flexibility in allocating and utilizing DoD logistical resources.

FADs are assigned by the Secretary of Defense, the Joint Chiefs of Staff or by each DoD component. A FAD is a one position numeric character that signifies the relative order of importance of an activity requesting supplies and equipment. FADs are identified by roman numerals I through V. FMS FADs are normally a lower priority than AF FADs for similar units.

UNDs are used if operational capability is jeopardized as a result of materiel nonavailability and are expressed varying degrees of urgency. UNDs are identified by alpha characters "A", "B", and "C". In general terms, a UND "A" means a weapon system is unable to perform the required mission, a UND "B" means a weapon system

can perform part of its mission but mission capability is impaired, and UND "C" means the weapon system can perform its mission but requires future requirements and stock replenishment for preventative maintenance. Fads and UNDs help determine the valid priority designator entry in MILSTRIP requisitions.

The follow UMMIPS chart relates the resulting priority designator based on a combination of a FAD and UND code of requisition:

**Table 2. UMMIPS Chart**

FAD	UND "A"	UND "B"	UND "C"
I	1 12 to 13	4 16 to 17	11 69 to 84
II	2 12 to 13	5 16 to 17	12 69 to 84
III	3 12 to 13	6 16 to 17	13 69 to 84
IV	7 16 to 17	9 69 to 84	14 69 to 84
V	8 16 to 17	10 69 to 84	15 69 to 84

  \* Time in days - overseas (DLA, 1993)  
 \* Includes requisition submission time receipt take-up time

### Standard Item Support

Requisitions submitted to AFSAC requesting current supply items, in the U.S. DoD inventory, are classified as standard items. Standard items are distinct parts that are regularly used and purchased by the U.S. DoD. Requisitions of this type are filled (supported) directly from U.S. DoD inventory stocks or as a part of a defense procurement of the item.

## **Nonstandard Item Support**

NSIs are non-active items that are no longer managed by AFMC. NSIs are those items or equipment not in the DoD inventory or purchased irregularly by the DoD for use. Nonstandard items are also classified as those articles that have country peculiar weapon system configurations. The installation of an NSI on equipment or system makes the weapon system dissimilar to equipment or systems managed in the DoD inventory.

Because FMS customers use NSIs, follow-on support is very difficult to provide since no supply points or item managers (who manage federal stock classes) are available. To conquer this problem, extensive manual procedures were needed to locate sources of supply to satisfy the customers requisitions. All military branches in DoD have established special purchasing systems to provide contractor support for NSIs.

These commercial systems are:

- 1) DLA, Contractor Operated Parts Depot,
- 2) U.S. Army, Simplified Nonstandard Acquisition Process,
- 3) U.S. Navy, FMS Acquisition Service Team Line (Defense, 1994:354), and
- 4) U.S. Air Force, Parts and Repair Ordering System.

These commercial systems are used for follow-on support when the item required is no longer managed or accessible through normal DoD channels. The requisition is then channeled to the contractor who researches, identifies, and purchases the needed item.

## **Evolution of FMS Nonstandard Item Follow-on Support**

AFMC is responsible for providing logistical support for aircraft and other weapon systems belonging to FMS customers. With this responsibility, AFMC furnishes supply and depot maintenance support for approximately 1600 weapon systems no longer operated by the U.S. DoD (Brown, 1993:23). Also, AFSAC arranges logistical provisions to particular foreign configurations of U.S. DoD operated systems; for example, the F-4, F-16, and C-130.

Prior to 1971, no standardized program existed to handle nonstandard requisitions. At the time, NSIs were handled on a case by case basis and the number of nonstandard items purchased was low, therefore, NSI support was not a problem. Yet, as weapon system sales increased so did the number of nonstandard items. This increase required a process that provided NSI support, as necessary. However, since no formal procedures were in place for NSI support, different levels of support were received by different methods (McLaughlin, 1985; Brown, 1993). The following discussion tracks the development of nonstandard item support from its inception with the Peace Hawk program to today's PROS program.

Peace Hawk. The Peace Hawk program was developed in 1971 with the Royal Saudi Air Force (RSAF). This program initially established support for F-5 aircraft and support equipment. After negotiating the third Peace Hawk program, the AF realized that the NSI program was expanding and traditional methods of NSI support were inadequate. In 1973, the AF created the Contractor Operated Depot (CONDEPOT) to fill NSI requirements.

Contractor Operated Depot. Upon the Air Force's request, Northrop Air Division (NAD) provided contractor operated supply support and repair facilities for nonstandard items. The purpose of the CONDEPOT program was to support NSI requirements much like the AFLC Depot Supply Support Program for the Peace Hawk program. In other words, NAD provided the RSAF a customized depot for NSI support. The RSAF directly requested NSI support from NAD. As CONDEPOT provided support for Peace Hawk I through III, the program continued to grow and be modified. Even though CONDEPOT was successful, the AF still had its original problem: the lack of procedural standardization for NSI support.

Beginning of a Nonstandard Item Support Policy. In 1974, a Security Assistance Impact Study (SAIS) on nonstandard support was conducted. The SAIS concluded that a problem existed. To resolve the issues that caused the problem, AFLC presented three alternative NSI support policies:

- 1) Initial and follow-on support for NSIs is negotiated between the FMS customer and the contractor applying DCS practices with no AFLC involvement,
- 2) Restricted AFLC involvement with maximum reliance upon the contractor to furnish follow-on nonstandard support, and
- 3) Cradle to grave AFLC support for nonstandard items (Picard and Phalen, 1977:21; Brown, 1993:28).

The second alternative was approved by the U.S.A.F. Air Staff in 1975, but the alternative could not be implemented until written procedures were developed.



PACER GODOLA was the project name given to alternative two - Nonstandard Item System Support (NISS). NISS was implemented in 1977. Under NISS, the USAF negotiated contracts with a company to provide logistical services. NISS procedures were only used for the RSAF Peace Hawk III through V program. The basic management of the NISS program covered the following areas:

- 1) Supply items based on RSAF demands which included requisitioning, distribution, and cataloging of nonstandard items
- 2) Provide a procurement and manufacturing nonstandard item capability
- 3) Engineering and maintenance services
- 4) Technical order maintenance
- 5) Overhaul, repair, and modifications
- 6) Configuration control

Two primary deviations between the CONDEPOT and NISS programs were: (1) NAD no longer provided warehousing to the RSAF and (2) national stock numbers were assigned to nonstandard items. The NISS program was modified in 1979 because NISS standardized procedures were not used to support nonstandard items outside of the Peace Hawk program.

Country Standard Item Support. The Country Standard Item Support (CSIS) resembled NISS but was enhanced so as to rely more heavily on the contractor. This improvement increased NAD's responsibility by increasing the number of systems under the Peace Hawk program. A minor change included in the CSIS program was stock screening by DLA to insure items were not on hand at the Defense Supply Center.

Controlled Multiple Address Letter. So far, all nonstandard item support policies only applied to the RSAF Peace Hawk program. Even though NISS was based on the Peace Hawk program, NISS procedures would eventually applied used to all nonstandard support cases. Under the CSIS system, nonstandard item support procedures were developed to provide nonstandard item follow-on support. In 1978, ALFC hosted an ALC meeting to work on the nonstandard item issue. A sequence of Controlled Multiple Address Letters (CMAL) were adopted and then established new nonstandard support procedures that lasted from the late 1970's until the mid 1980's. This new policy provided nonstandard support guidance to all FMS follow-on support functions to all appropriate FMS cases instead of case by case management. Table 2-3 provides a synopsis of CMAL letters summarizing the NSIS period of follow on support:

**Table 3. CMAL Synopsis**  
**Controlled Multiple Address Letters - 1979 to 1985**

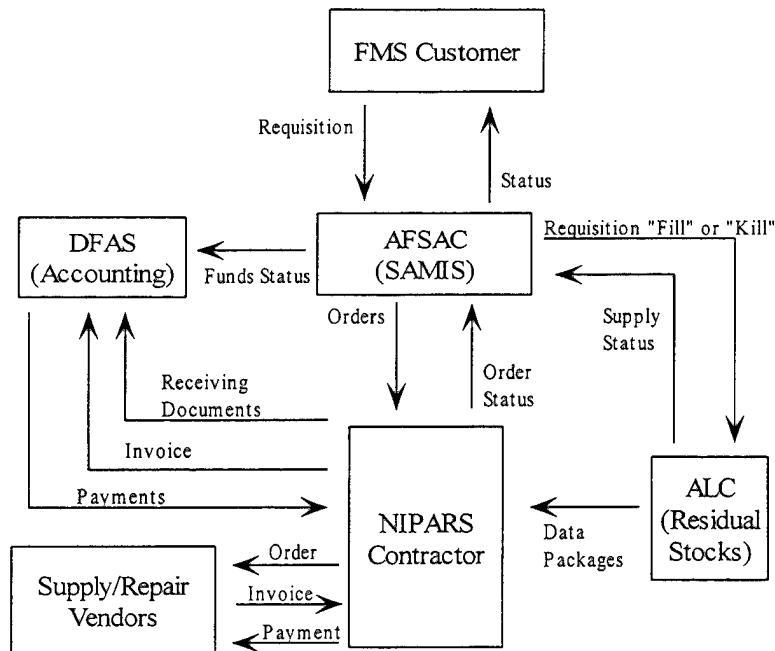
CMAL	Purpose
CMAL 78 - 5	Provided prearranged contractual support for nonstandard systems by negotiating contracts with sub system vendors and letting contracts for spare parts procurement, depot level maintenance, T.O. verification and validation, and technical services.
CMAL 79 - 1	Extended CMAL 78-5 providing support for provisioning, P&A studies, definition, cataloging, technical orders, engineering and technical services, follow-on support item supply, depot repair, configuration accounting, and system activation manpower funding.
CMAL 82 - 1	CMAL 79-1 was extended annually and not incorporated into any applicable Air Force regulation consequently, CMAL 82-1 was designed to incorporate nonstandard support policies into permanent regulations. CMAL 82-1 was never implemented.

(McLaughlin, 1985:64-69)

The NISS program eventually was replaced by Nonstandard Item Parts Acquisition and Repair System (NIPARS).

NIPARS. In 1990, NIPARS was implemented to consolidated the NSI procurement procedure and to improve NSI support. The NIPARS objective was to simplify nonstandard support for AFSAC and FMS customers. Simplification eliminated nonstandard FMS cases and established a contractor-operated organization. Instead of writing separate contracts for each nonstandard item case, NIPARS charged a standard surcharge for procurements (Brown, 1993:41). NSI requests were no longer negotiated on a case-by-case basis.

In 1992, Captain de Kam and Captain Tribble evaluated the initial effectiveness of the contractor operated NIPARS program. They concluded that NIPARS improved support of NSIs (de Kam and Tribble, 1992). In 1993, Flight Lieutenant Brown accomplished a follow-up thesis to the de Kam and Tribble work. Again, it was concluded that NIPARS improved follow-on logistical support for NSIs compared to the system that it replaced. Some of NIPARS strongest points were the reduced FMS customer requisition lead times and its effective source of NSI supply procurement for FMS customers, with limited acquisition personnel in the U.S. (Brown, 1993:136). The following figure shows the NIPARS program process flow:



**Figure 1: NIPARS Requisition Flow (Brown, 1993)**

Included in NIPARS for FMS customers were purchasing and transportation functions. AFSAC provides oversight functions like accounting and monitoring contractor progress.

Because of the success of the NIPARS program and the push for O&P, the PROS program was created. PROS extends support beyond NSIs. It now includes follow-on support for almost all items. The following figure was adapted from the Brown thesis and the Wilken thesis to show how NSI procurement has been modified to create today's PROS system:

**Table 4. History of FMS Follow-on Support Policies and Programs**

Period	Concept	Major Theme
pre-1971	None	Nonstandard support provided on and ad hoc basis
1971-1976	CONDEPOT	NAD provided most nonstandard support, to include warehousing in CONUS. Total package system approach to support weapons system sale.
1976-1979	NISS	SA-ALC draft procedures (PACER GONDOLA) for NAD-provided support of nonstandard items. Used only for RSAF Peace Hawk program. Aimed at total package support for all elements of ILS.
1979-present	CSIS	Contractor-supported program for RSAF. Increased NAD responsibility for nonstandard items. Continued total package approach.
1978-1990	NSIS	Series of CMALs prescribing AFLC policy towards nonstandard item support. Continued total package approach.
1990-1995	NIPARS	Contract for nonstandard support via prime contractor and vendors. Applicable to all FMS countries and almost all cases. Concentrates on follow-on logistics support with provisions to task orders to address other logistics requirements if required.
Dec 1995-present	PROS	NIPARS concept expanded to include support for standard supply and reparable items in addition to nonstandard items supported by NIPARS.

(Brown, 1993 and Wilken, 1996)

## **PROS**

Given the success of NIPARS, the program was expanded and its scope broadened. On 14 December 1995, Science Applications International Corporation (SAIC), San Diego, CA was awarded the PROS contract. The contract period is from 14 February 1996 through 13 February 1998 with three one-year option periods. As with NIPARS, PROS is managed by AFSAC.

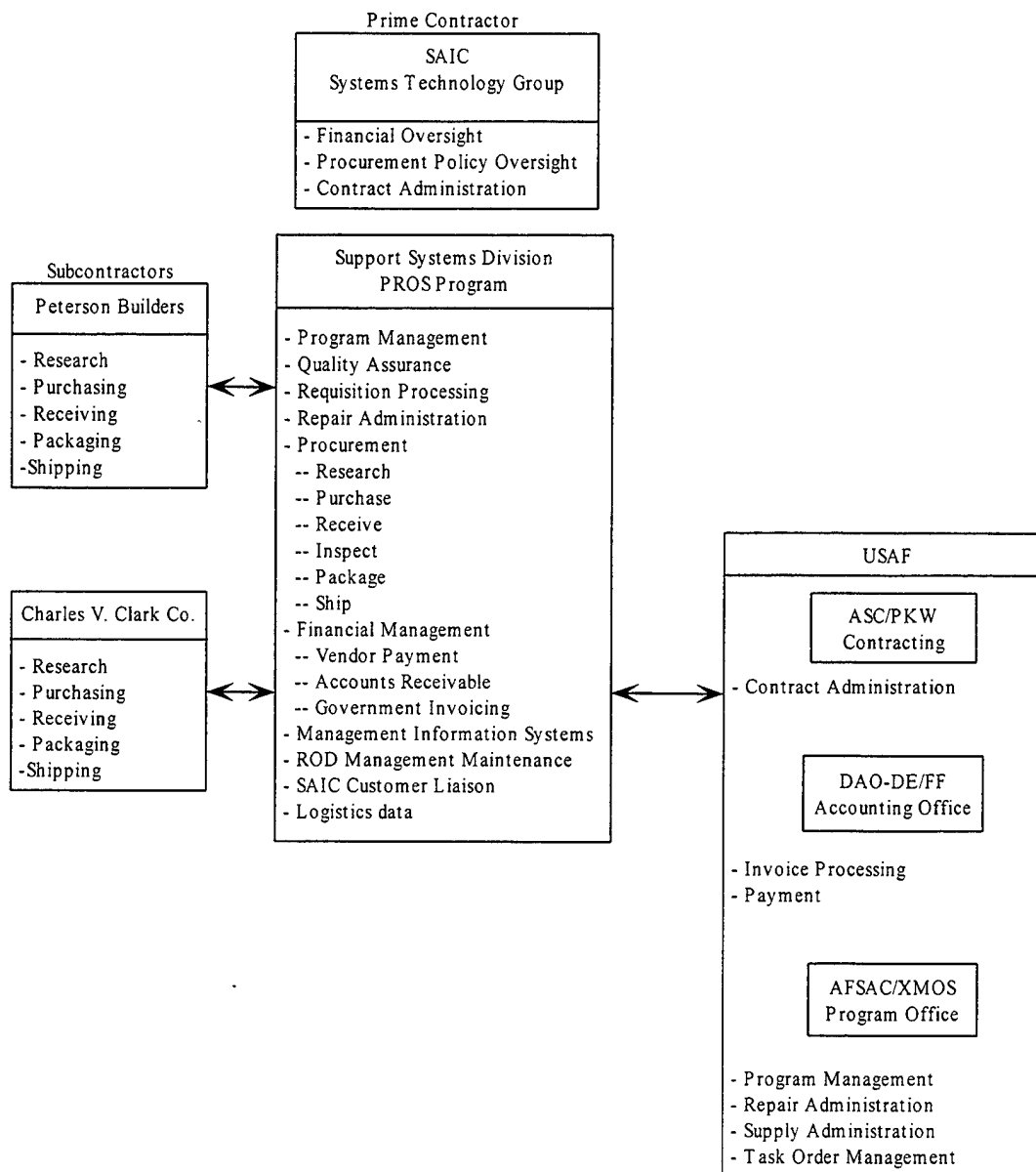
Due to customer feedback and the continued push for O&P, PROS was modified from the NIPARS program. The most notable change in PROS is the capability of the FMS customer to purchase a wide range of standard and nonstandard supply parts and

repair services quickly, efficiently and at attractive prices (SAIC). Per the statement of work, costs will only be charged to each FMS customer for the support provided.

As ALCs provide FMS customer support; PROS does likewise. Classification of nonstandard or commercial items can be laborious and time consuming when accomplished by ALCs. Many times these items can be purchased, faster and cheaper, commercially rather than through the ALCs (SAIC). Although PROS purchases supply parts and repair services, AFSAC oversees SAIC's performance and controls the flow of FMS requirements to them.

#### **PROS Contractor and Subcontractor**

SAIC, of San Diego, CA (the main office), is the prime contractor of the PROS program. Their team consists of two primary subcontractors that assist with purchasing supplies under the PROS contract. They are Charles V. Clark, located in Centerville, OH, and Peterson Builders Inc, located in Sturgeon Bay, WI. The Air Force and PROS contractor organizational relationship is presented in the following figure.



**Figure 2.** AF and PROS Organizational Relationship (PROS, 1997)

## PROS Objective

In 1995, AFSAC implemented the PROS program to consolidate the NSI procurement process and to improve NSI support. The main objective of the PROS program is to provide a service that becomes the preferred choice of FMS customers when choosing a method of follow-on support (Braet).

## **PROS Eligible Items**

The PROS SOW defines an eligible item as “any item that is not actively managed or for which the managing activity does not have FMS organic capability or contractual supportability is eligible” (SOW, 1995). To qualify as a PROS eligible item the item must have a part number or a national stock number that is in government data bases or commercial data bases and needs to support the country’s Security Assistance military infrastructure (SOW, 1995).

Defense items prohibited from procurement under the PROS program are residual stock or FMS repair support that exists at DoD/General Support Administration sources of supply or repair. Also, items prohibited for FMS procurement, by law, are:

- (1) ammunition and explosive portions of cartridge actuated devices,
- (2) propellant devices, and
- (3) classified items.

Items that may be considered PROS eligible, with program management office approval, and contractor acceptance are items containing ozone depleting substances (PROS).

## **PROS Pricing**

Supply Fill Fee. The FMS customer pays a supply fill fee per requisition for contracting services rendered, instead of paying a percentage of the items value, which



covers processing and administrative charges. Supply fill fees include the following costs:

- (1) research,
- (2) purchasing,
- (3) receiving,
- (4) packaging, and
- (5) shipping.

For each requisition the supply fill fee is determined by the value of the requisition and the priority ordered. For example, a requisition that costs \$150 that is a routine order, will be charged a fixed fee of \$49. The following is a supply fill fee chart.

**Table 5. Supply Fill Fee**

<b>FILL FEE</b>	<b>NMCS</b>	<b>URGENT</b>	<b>ROUTINE</b>	<b>ECONOMY</b>
\$ 1 - 250.00	\$59	\$53	\$49	\$48
\$ 250.01 -1,000	\$82	\$74	\$68	\$66
\$ 1,000.01 - 2,500	\$102	\$92	\$85	\$84
\$2,500.01 - 10,000	\$149	\$135	\$125	\$122
\$10,000.01 - 25,000	\$272	\$246	\$227	\$223
\$ 25,000.01 - 50,000	\$514	\$465	\$428	\$422
\$ 50,000.01 - 100,000	\$995	\$899	\$829	\$816
\$ 100,000.01 - 500,000	\$2,190	\$1,997	\$1,825	\$1,815

(Shipley, 1997:36)

Award Fee. Besides supply fill fees, SAIC can earn quarterly award fees. Award fees are an incentive that encourages SAIC to provide excellent support to FMS customers. When SAIC submits the final bill for a requisition it will include funds to cover the material cost, the fill fee, and an award fee amount. When SAIC submits their invoice for the requisition, SAMIS places the award fee amount into an award fee account. The award fee is based on the final bill of the requisition. At the end of each quarter, the contractor is evaluated on supply efficiency, effectiveness and application of contractor's quality assurance plan, administrative efficiency, overall responsiveness to DoD/foreign country representatives, and NMCS/urgent requisition responsiveness and then, SAIC receives a proportional amount of the award fee based on the level of performance provided.

The maximum amount of the award fee that the contractor can receive is a quarter of a million dollars. However, no one country pays this total amount, they all pay a portion based on there requisition values. As a result, some will pay more than others.

### **Contractor Performance Measures**

An important element of the PROS program is the award of bonuses to SAIC, which is based on performance. The amount of the bonus received is dependent upon the achievement of the performance criteria.

Cancellation Rate. Ensuring a high level of service is important to AFSAC. Currently, the cancellation rate is 2%, which is lower than the satisfactory cancellation rate of 4% (SAIC).

Requisition Processing Lead Time. RPLT is defined as the time between the date of receipt of the requisition at SAMIS and the date of the contract for that requisition.

Effectiveness and Application of Contractor's Quality Assurance Plan. Per the SOW, AFSAC wants to ensure the customer country receives high quality items from vendors which display strong quality assurance programs.

Administrative Efficiency. This is the efficiency of the contractor to administer and process requisitions. Administrative efficiency is measure by the number of electronic billing errors, timely status updates, and the quality of narrative messages (Shipley, 1997:38).

Overall Responsiveness to DoD/Foreign Country Representatives. This is defined as the contractor's responsiveness to the requirements of the contracting officer, the program management office, the AFMC country/case managers, the other DoD representatives, and the foreign country representatives.

Not Mission Capable Supply/Urgent Requisition Responsiveness. Not Mission Capable Supply (NMCS) is an urgently needed item that is currently grounding an aircraft from performing its mission as required. Performance criteria for this measure is RPLT, shipping delivery and date, and communication with foreign country representatives (slide).

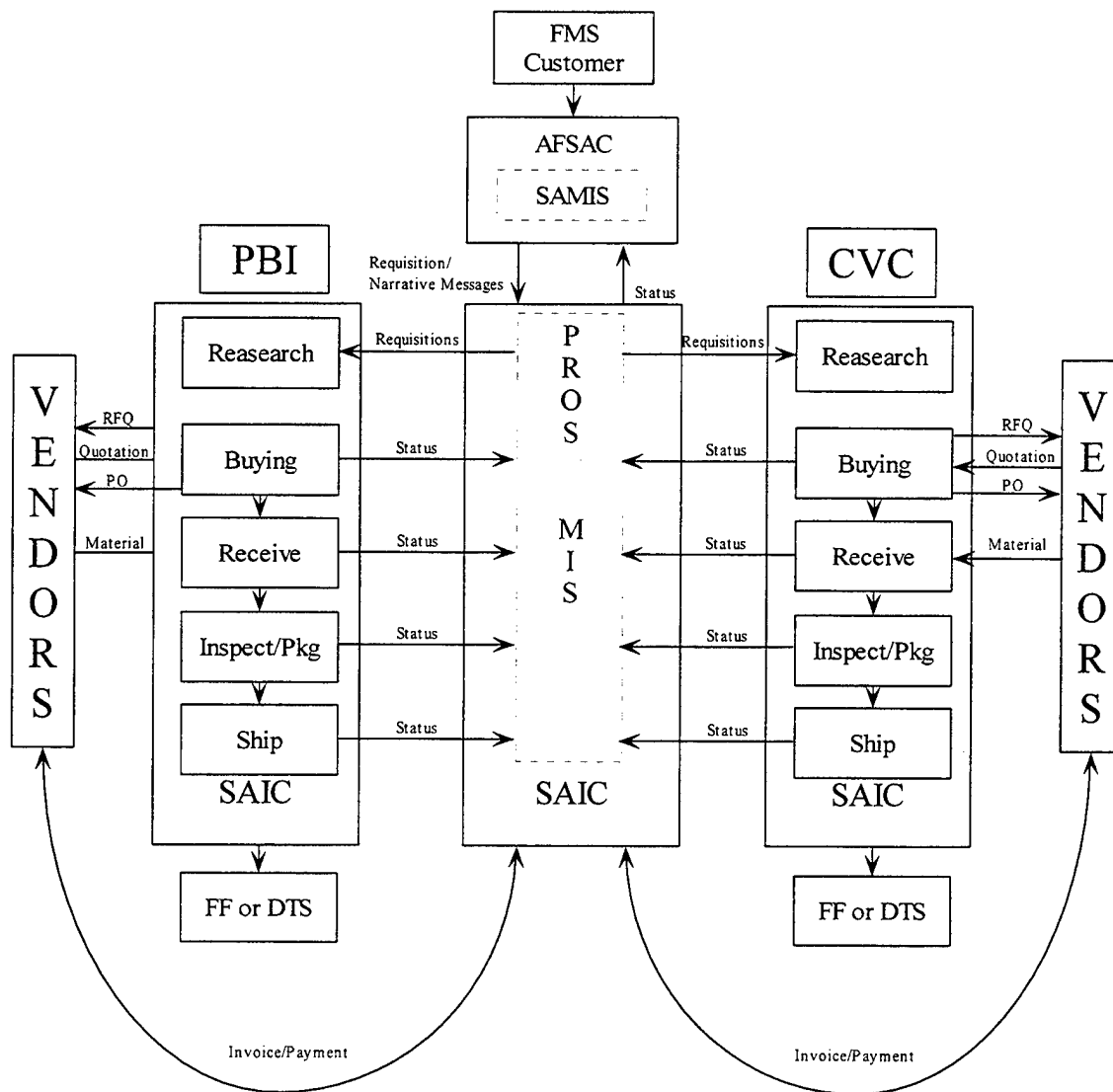
## **PROS Requisitioning Processing Procedures**

All requisitions begin with the FMS customer, the AFSAC case manager or a system program manager at an ALC. Every FMS country that submits a requisition must be ordered against an approved LOA for their country. Requisitions are entered into

Security Assistance Management Information System (SAMIS) directly or through a stand alone STARR PC system. Identification of the requirement is based upon information contained in the document number. The document number, identifies that particular requisition. Also, SAMIS identifies the requirement by a routing identifier code, which allows the system to route the requirement properly.

When the requisition is received by AFSAC personnel, they review it to see if the requirement can be filled through ALC residual stock or through organic support.

AFSAC personnel also verify the availability of funds before the requirement is passed to the PROS contractor for action. AFSAC and SAMIS treat the PROS contractor as a conventional supply point and pass the MILSTRIP documents to the PROS contractor's information system (SAIC). Once received by the PROS contractor, they research, buy, receive, inspect, package, and ship the material to the FMS customer's freight forwarder. PROS's information system passes MILSTRIP updated status to SAMIS so the FMS customer is informed of all requisition status. The following figure describes the flow of requisitions using PROS.



**Figure 3. PROS Requisition Processing Procedure (SAIC)**

### Summary

The US plays an important role in helping to maintain world peace. One element that the USG uses to accomplish this is the SA program. SA programs, through foreign military sales, allow the government to provide a complete range of services from procurement to follow-on support.

O&P were first used to help standardize FMS procurement; however, today it is becoming a necessity as a result of decreasing military budgets and manpower.

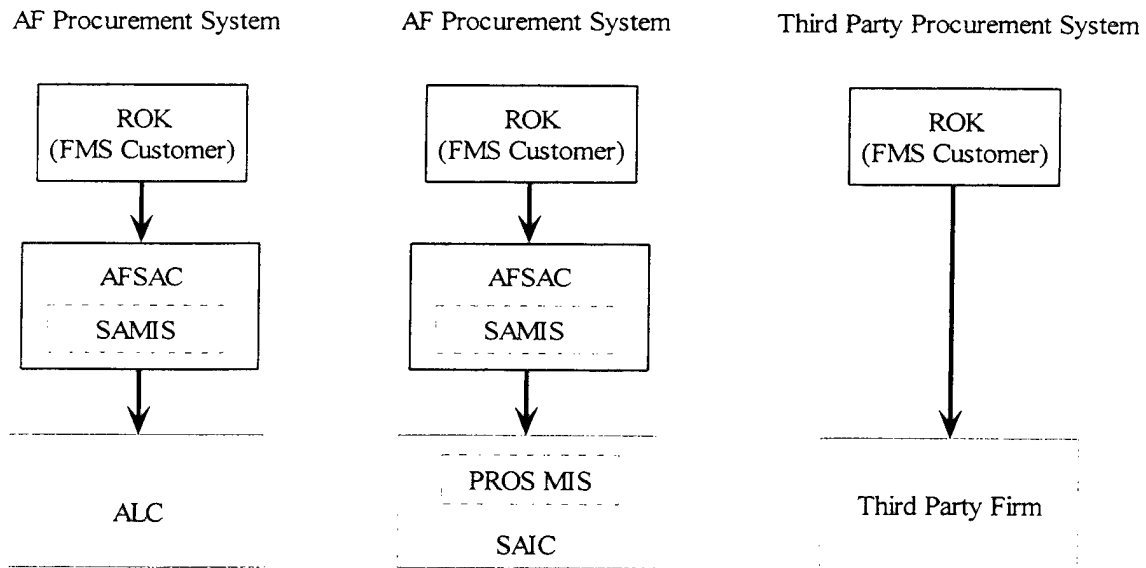
Continued USG O&P initiatives will some how effect FMS follow-on support but to what degree, is not known. Since the USG is quickly pressing O&P efforts for depot privatization it is becoming necessary for FMS customers to look for other alternatives for FMS follow-on support. One such FMS alternative is a direct commercial means of support (i.e. no longer go through AFSAC). The best alternative will be dependent up a country's budget, inherent capabilities, and long-term objectives.

### III. Methodology

#### Introduction

In this chapter, the research methodology is explained to help achieve the previously stated research objectives from Chapter 1. The research design used for our research is *ex post facto* since we will be analyzing historical data. Investigators use an *ex post facto* design when they cannot manipulate the variables of interest -- the measurement of the variables is after-the-fact (Emory, 1995:115). A description of the population and a sample of interest including the identification of variables of interest, the type and source of data to be analyzed, and the specific methodology to be employed to address each investigative question will be discussed meticulously.

The purpose of this thesis is to draw conclusions on performance and cost comparisons between three different procurement systems for the ROK. Acquiring, purchasing, and shipping items are the services provided by these procurement systems. The procurement systems will be referred to as the AF standard procurement system, the AF PROS procurement system, and the direct third party procurement system, which will be used for all item requisitions. The AF standard procurement system consists of the FMS customer procuring items through AFSAC's SAMIS system and then through the AF's ALCs. The AF PROS procurement system consists of the FMS customer procuring NSIs through AFSAC's SAMIS system and then through PROS. Third party procurement is defined as direct FMS customer item procurement, by-passing AFSAC, by means of a third party provider. The following figure depicts all of the procurement systems.



**Figure 4.** AF and Third Party Procurement Systems

We were unable to obtain foreign military sales data from a third party logistics firm to thoroughly conduct this research. The reason that third party firms would not provide the necessary data, as they stated, was because the information was proprietary. So, we decided to use the PROS fill fee matrix (Table 5) to estimate the cost incurred by a third party firm. Thus, the PROS procurement system was used to create a surrogate third party procurement system. To create the surrogate firm we will obtain 200 common national stock numbers that have been requisitioned through the AF ALC procurement system and the AF PROS procurement system. Next, we will calculate the lead time differential and unit cost differential from the averages of each system. Then 200 more completed requisitions will be taken, which are different from the previous set and have been completed by any means in the AF and apply the lead time differential and unit cost differential to them. This will be accomplished by multiplying the completed requisition unit costs by the average cost differential (between the matched pairs of NSNs of the AF



PROS procurement system and the AF ALC procurement system) then adding the PROS matrix fill fee to obtain total unit price. This allowed us to estimate the data of the surrogate third party procurement system. All data concerning the national stock numbers was provide by the SAMIS system located at AFSAC.

### **Variable Definitions**

To ensure a fair comparison of the two procurement systems we used the same measuring tool for both systems. For this reason, TPLT and unit cost statistics will be computed identically for both procurement systems. Both variables will allow conclusions to be drawn from the differences, if any, between the two systems.

Total Procurement Lead Time. TPLT is the most important variable of interest to the FMS customer. TPLT is the length of time from SAMIS receipt of a requisition and issue of BW status to the actual shipping date status, AS1, as seen by the FMS customer.

TPLT is necessary to compare the performance of both procurement systems'. The time period between receipt of a requisition into SAMIS to the actual reporting of shipment status is TPLT. For this study, when the SAMIS formally accepts the procurement order from the FMS customer, TPLT starts. Therefore, BW status means a requisition has been accurately received by SAMIS and actions to procure the item have started. Shipment status, AS1, takes place when the item is ready for shipment from the contractor. AS1 status is not a precise evidence of delivery to an FMS customer but only an indication that transportation arrangements with the FMS customer's freight forwarder are being made.

Total Unit Price. Total unit price is the final amount which an FMS customer pays to include supply fill fees. For the AF procurement system the total unit price will be the item's source of supply unit price and the FMS administrative fee. The total unit price for the AF system will be calculated by dividing the dollar value of the requisition by the quantity ordered and then adding the three percent administrative surcharge.

The factors that an FMS customer would pay, if the items are procured directly through a third party firm, are the source of supply unit price, and fill fee, which is based on the requisitions priority and dollar value. The total unit price for the third party firm will be calculated by applying a cost differential factor, which will be calculated from the current AF system and the PROS system, to the AF systems source of supply unit cost and then adding a fill fee price. The cost differential will be calculated by finding the percent difference between the two systems (ALC and PROS procurement system) average total unit cost. Averages for both systems will be calculated to obtain an average total unit cost per requisition. Once the cost differential has been calculated we will multiply the unit cost of the requisition by the differential and then add this to the unit price which will provide the material costs of the third party surrogate firm.

### **Population and Sample Description**

A population is a set of existing units about which some inferences can be made (McClave, 1994:6). For the purpose of this study the population will include all AF and PROS NSI requisitions from the ROK.

“A sample is a subset of the units of the population” (McClave, 1994:6). The sample chosen for this study includes completed requisitions from the ROK, which were supported through the ALCs and PROS.

Population One. The first population examined is 200 South Korean AF NSI requisitions that have been completed by the AF standard procurement system and AS shipment status code is recorded in SAMIS. Only those requisitions with national stock numbers (NSN) that can be matched to identical NSNs procured by the PROS system will be included. The time frame of interest covers 3 December 1989 to 17 May 1997.

Population Two. The second population examined is 200 South Korean AF NSI requisitions that have been completed by the AF PROS procurement system and AS shipment status code is recorded in SAMIS. Only those requisitions with NSNs that can be matched to identical NSNs procured by the ALC system will be included. The time frame of interest covers 6 September 1994 to 14 April 1997.

Population Three. The third population examined is 200 South Korean AF requisitions that have been completed by any AF procurement system and AS shipment status code is recorded in SAMIS. AFSAC personnel through the SAMIS database randomly generated this population. AFSAC personnel submitted a query to the SAMIS database requesting 200 South Korean completed requisitions. The time frame of interest covers 26 January 1993 to 6 August 1997.

### **Data Collection**

All data that will be analyzed for this research will be extracted from AFSAC's SAMIS database, which is a computer system used for FMS management and requisition

routing and control. PROS data is reported to the SAMIS database, therefore the data required for this study comes from a single source.

The data to be examined will consist of all requisitions in populations one and two, which have matching NSNs. Data was selected to compare AF procurement and direct third party procurement performance as measured by TPLT and total unit cost. By collecting data on common variables we can compare the two systems. This will allow us to determine the average time an item spends in the requisition phase and how much it costs on average.

To help obtain the data, a standard request for extensive requisition data was submitted to the Korean Liaison Officer at AFSAC. Collected data from the resulting SAMIS product included the stock number, SAMIS process date, shipping date, requisition priority, and unit price. The data collection method allowed us to find TPLT and unit cost for the AF procurement system and the PROS system. Subtracting the SAMIS process date from the date the item was shipped yielded TPLT. The unit price for each requisition was figured by dividing the total requisition price by the quantity ordered.

Our collection method for the third party firm procurement system will be accomplished by applying a cost differential and lead time differential (from the AF and PROS systems) to population three. We will estimate TPLT and total unit price for a third party firm by applying the lead time and cost differential to population three, which consists of South Korean requisitions that have been completed by any means within the AF. Once the surrogate third party's material cost has been calculated, that price will be used to determine the appropriate supply fill fee for that requisition. To calculate the total

unit cost of the requisition we will then add the surrogate third party's material cost to the supply fill fee.

Since our study is *ex post facto*, we are unable to influence data changes. Therefore we assumed the data integrity of the SAMIS database to be accurate and not questionable in any way. Even though this is a bold assumption, we have no way of speculating on the size or effect on data integrity for this study. Thus, we had no way to compensate for any data integrity affect that might have been present.

### **Analysis**

We will use averages, on the data collected from SAMIS, to perform the analysis. Averages will allows us to analyze the data on an average requisition basis. This segment will explain this tool as well as the method and its applicability to the data.

According to McClave and Benson, extreme observations that are detached from the balance of the data are called outliers. Usually outliers require special attention in statistical analysis. Although outliers represent actual measurements, mistakes are made and data is mis-recorded, mis-coded during data entry, et cetera. However, this study treats outliers as any other measurement since they represent legitimate measurements from the data source, SAMIS. Also, our research questions are focused on what the FMS customer normally encounters when requisitioning items. Therefore, to achieve an accurate picture of TPLT, and total unit cost outermost data points need to be included, since they do occur.

To perform all required calculations and analysis, the data were imported to Microsoft Excel (version 7.0). This software was chosen because of convenience and ease of use for population comparisons.

The mean is the most widely and understood method of central tendency for interpreting a quantitative data set. "The mean of a set of quantitative data is equal to the sum of the measurements divided by the number of measurements contained in the data set" (McClave, 1994:50). The mean of each population set will provide a representation of the time a requisition/item flows through the procurement system.

Step 1. To calculate the surrogate third party logistics firm unit cost and lead time we will calculate the mean of unit cost and lead time for both population's one and two, the AF standard procurement system and the AF PROS procurement system, respectively. Once the averages have been obtained, the cost differential and lead time differential will be calculated. To calculate the differentials, we will subtract the ALC's average from the PROS average and then divide the result by the PROS' procurement average. This will provide the cost differential and lead time differential, which will be applied to population three to for the third party surrogate firm.

Step 2. To obtain the total unit price for the surrogate firm, we will use the NSNs in population three and multiply each NSN's unit price by the cost differential. Then using the PROS matrix fill fee, we will add the fill fee (which is based on item cost and priority). Upon completion, we will again calculate the total unit average cost. Lead time will be calculated by applying the lead time cost differential to each NSN's lead time and then take the total lead time average.

To obtain the ALC's total unit price we will multiply each NSN, in population three, by a 3 percent administrative surcharge applied by AFSAC. AFSAC uses this administrative surcharge to support their support operations to the FMS customer because the USAF does not budget to support AFSAC; AFSAC must be self-sufficient. Lead time for the ALC system will be calculated by averaging the lead time of the 200 randomly generated stock numbers. This is possible since all requisitions from population three were satisfied by Air Force procurement systems, except the PROS system.

Step 3. The last average of NSNs to be calculated will be accomplished by using the U.S. Navy's FMS procurement system, FASTLINE. The FASTLINE supply fill fee matrix is based on priority, only, not item cost. Again, we will take the population three's unit cost with the applied differential and then calculate, by priority, the FASTLINE total unit average cost.

Step 4. Finally, once all computations have been completed for each procurement system, each system will be compared to all other procurement systems in this study. Thus, allowing for a thorough comparison to be completed. This comparison will evaluate which system will benefit South Korea the best in cost and lead time.

## **Summary**

This chapter describes the methods and reasoning in collecting and evaluating the data. This data is used to help answer each investigative question in Chapter 1. Also, this chapter presents the methodology employed to conduct our research. Furthermore, it

describes how the research analyzed the data to respond to the investigative questions as well as explanations of our research procedures.



## **IV. Results**

### **Introduction**

This chapter describes the analysis accomplished, in this study, and provides the results. The chapter lists the results for each investigative question, which forms the basis of this study.

### **Lead Time Analysis**

Two types of analysis was performed on the lead time data. The first analysis consisted of comparing the lead time means from the AF ALC procurement system, the AF PROS procurement system, and our third party surrogate procurement system. Unfortunately, we were unable to obtain any lead time data on FASTLINE; therefore, no FASTLINE lead time data was used in this study. The second analysis compared requisitions by priority between the ALC and PROS system.

The first part of the analysis started with determining the lead time differential between the AF system and the PROS system. The original data set consisted of 200 NSNs that were common to both systems. The results are reproduced in Table 6.

**Table 6. Lead Time for Matched NSN Pairs**

	<b>Average Lead Time</b>
<b>ALC System</b>	194.94
<b>PROS System</b>	183.72
<b>Difference</b>	11.22
<b>Percent Difference</b>	6.11%

The average lead times from both systems are very similar. On average, it takes a foreign military sales requisition, through the ALC system, 195 days and the PROS system 184 days, approximately. The eleven days difference equates to a 6.11 percent differential, in favor of the PROS procurement system.

Upon inspection of the data, two stock numbers the ALC system supported outrageously exceeded the number of days it took the PROS system to support. Stock number 1560-00-890-3703 took the ALC system 2,593 days to fill while the PROS system supported the requisition in 181 days. Also, stock number 1650-01-232-0561 took the ALC system 1321 days to fill while the PROS system supported the requisition in 941 days.

As discussed in Chapter 3, we decided to keep these two outliers in our sample to calculate the percent differential. Again, the reason this was concluded is that the data is historical and the requisition actually occurred. Removing the outliers would cause the two procurement systems to have a lead time differential of approximately 1.5 percent. If this were the case, then there would be little value added to the foreign customer in order to use the PROS procurement system; the foreign customer would be better off using the USAF ALC procurement system, even though lead time takes a little longer. The ALC system is better off for the FMS customer because it is cheaper than the PROS system.

For the random requisitions that were completed by any means within the Air Force, we applied the 6.11 percent differential. As expected the surrogate third party firm will be faster than the AF procurement system. The results are reproduced in Table 7.

**Table 7. Lead Time for Random NSNs**

	<b>Average Lead Time</b>
<b>AF System</b>	238.99
<b>Surrogate Third Party System</b>	224.38
<b>Difference</b>	14.6

As mentioned above, the PROS system does not guarantee a significant reduction in lead time compared to the ALC system. The eleven day difference may not make that big of a difference in reducing lead time for the ROK when urgently needed. Therefore, we also analyzed the PROS system and the ALC system based on priority differences. The results are reproduced in Table 8.

**Table 8. PROS and ALC Lead Time Difference According to Priority**

	<b>PROS = ALC Priority</b>	<b>PROS Priority &gt; ALC Priority</b>	<b>PROS Priority &lt; ALC Priority</b>
<b>Quantity of NSNs</b>	96	43	62
<b>Difference in Days</b>	18.06 (slower for PROS)	28.47 (faster for PROS)	44.6 (faster for PROS)

When the two systems have the same priority, the PROS system (population two) takes 18 days longer than the ALC system (population one). When the PROS system, (population two) has a higher priority than the ALC system (population one), PROS is 28.47 days faster than the ALC system, which makes sense. However, when the ALC system (population one) has a higher priority than PROS (population two), the ALC system is 45 days slower than the PROS system. Since we used the lead time differential of 6.11 percent between these two systems and applied it to our surrogate third party firm it is conceivable that the surrogate firm would mimic the PROS system when compared to the ALC procurement system.

After analyzing the lead time by specific priority, we analyzed the lead-time difference according to priority category: not mission capable supply (NMCS), urgent, and routine. The results are reproduced in Table 9.

**Table 9. Lead Time Difference According to Priority**

		NMCS	URGENT	ROUTINE
<b>PROS System</b>	<b>Quantity of NSNs</b>	87	93	21
	<b>Lead Time</b>	191.45	173.71	196.05
<b>ALC System</b>	<b>Quantity of NSNs</b>	103	79	19
	<b>Lead Time</b>	184.39	222.63	137

According to the above table, the PROS system is 18 days faster at satisfying an urgent requisition compared to a NMCS requisition. PROS routine requisitions follow a logical pattern of taking longer than NMCS or urgent but we thought a routine requisition would be considerable longer than just five days compared to NMCS. The ALC system also follows a logical pattern when comparing NMCS to urgent priorities, the lead time goes up; however, when an FMS customer orders a routine requirement it comes in faster than a NMCS or an urgent requisition. We cannot explain why a routine requisition is so much faster but we believe that routine requisitions are probably being satisfied by inventory stocks on-hand. Again, since PROS is a surrogate to our third party firm, it is conceivable that our third party firm will act in the same manner.

Results – Investigative Question 1. The investigative question sought to discover if a difference between the average TPLT for items procured under the AF standard procurement system compared to items procured through a third party firm for all South Korean requisitions. Using the means located in Table 2, the mean TPLT for the AF

system is approximately 239 days. The TPLT for the surrogate third party firm was 224 days, approximately. The surrogate third party's TPLT performance takes longer than the ALC system TPLT performance by an average of 14.6 days.

### **Total Unit Cost Analysis**

The analysis of the total unit cost data produced surprising results, which suggests that the surrogate third party's total unit costs are significantly more than the ALC procurement system. To obtain reasonably accurate material costs for the surrogate firm's requisitions, we took the cost differential of the ALC standard procurement system and the PROS procurement system. Next, we applied this percentage to the material costs of the 200 randomly generated NSNs. These NSNs are representative of all items South Korea could submit to the third party firm, they contain standard and non-standard item requisitions. Once the material costs was calculated, we applied the supply fill fee matrix (Table 5) to each requisition by dollar value and priority. The supply fill fee matrix cost consists of overhead and third party profit. To obtain the total ALC cost per requisition, we added the three percent FMS administrative surcharge to each requisition.

Again, only one type of analysis was performed. The analysis took the mean total unit price for population and compared the systems by NSN. Thus the average total unit price per requisition between each system was analyzed. The systems analyzed were:

- 1) the AF standard procurement system,
- 2) the PROS procurement system,
- 3) the third party surrogate procurement system, and
- 4) the U.S. Navy's FASTLINE procurement system.

The analysis started with finding the unit cost differential between the AF standard system and the AF PROS system. Again, the original data set consisted of 200 NSNs that were common to both systems. The results are reproduced in Table 10.

**Table 10. Unit Cost for Matched NSN Pairs**

	<b>Average Unit Cost</b>
<b>ALC System</b>	\$2,225.12
<b>PROS System</b>	\$2,768.46
<b>Difference</b>	\$543.34
<b>Percent Difference</b>	19.63%

The average unit costs for both systems differ greatly. On average, an FMS requisition through the ALC system costs the FMS customer \$2,225.12 compared to the PROS system which costs the customer \$2,768.46. The difference of \$543.34 equates to a 19.63 percent differential, in favor of the ALC system.

Upon careful review of the data, the AF PROS system exceeds the unit cost of the AF standard system 81.5 percent of the time. In other words, 18.5 percent of the time the AF ALC system costs more than the PROS system. Because of this large difference we summed the differences, of each NSN between the PROS procurement system and the AF ALC system, to discover how hefty a price tag is associated with PROS. The PROS procurement system costs \$110,498.10 more than the AF standard procurement system for our populations. Again this is just material cost; supply fill fees have not yet been added. The fill fees equate to the third party's overhead and profit.

To obtain the AF average total unit cost per requisition we applied the three percent administrative surcharge to the dollar value of each stock number. Next, we calculated the average total unit cost per requisition.

For the third party surrogate firm, we took the random requisitions that were completed by any means within the Air Force. We applied the 19.63 percent differential to material cost. Next, we applied the supply fill fee matrix fees to the material cost. Using the unit cost and the priority of each requisition we applied the appropriate fees. As expected, the surrogate third party firm would be more expensive than the AF procurement system. The results are reproduced in Table 11.

**Table 11. Unit Cost for Random NSNs for Surrogate Third Party**

	<b>Average Unit Cost</b>
<b>ALC System</b>	\$2,225.91
<b>Surrogate Third Party System</b>	\$2,674.89
<b>Difference</b>	\$448.98
<b>Percent Difference</b>	20.17%

Using the random requisitions to compare the total unit cost between the ALC procurement system to the surrogate third party system resulted in a big difference. The surrogate third party firm, with overhead and profit added through the supply fill fee matrix, cost \$448.98 more than the AF ALC system. The third party surrogate equates to a 20.17 percent increase in total unit cost compared to the ALC procurement system.

The final cost comparison to be done using the randomly generated requisitions was between the AF procurement system and the Navy's FASTLINE program. We used the FASTLINE program to see if there is a cheaper method that could be used by a third

party firm to decrease costs for a customer compared to the PROS surrogate third party firm.

The FASTLINE system uses a matrix based on priority only. The three priorities are NMCS, routine, and economy. The fill fees for these priorities are \$143.70, \$61.61, and \$39.90 respectively. A limitation of the FASTLINE program is that it does not support requisitions over \$25,000.00. However, the FMS customer can negotiate a separate contract with the Navy and the FASTLINE vendor to purchase that item. Because of this limitation we reviewed our data and found only one stock number that filled this criterion. Therefore, we removed it to conduct our test. Instead of having 200 NSNs we used 199 NSNs to compare the average unit cost. The results are reproduced in Table 12.

**Table 12. Unit Cost for Random NSNs for FASTLINE**

	<b>Average Unit Cost</b>
<b>ALC System</b>	\$1,990.01
<b>FASTLINE System</b>	\$2,028.25
<b>Difference</b>	\$38.24
<b>Percent Difference</b>	1.89%

Using the random requisitions to compare the total unit cost between the ALC procurement system to the FASTLINE system did not result in a large difference. While the ALC system costs \$1,990.01, the FASTLINE system only costs \$2,028.25. The FASTLINE program, with the supply fill fee matrix, costs \$38.24, on average, more than the ALC system. The FASTLINE system equates to a 1.89 percent, on average, increased cost over the AF ALC standard procurement system.



Results- Investigative Question 2. Investigative question two looked to discover if a difference between the average total unit price for items procured under the AF standard system compared to items procured through a third party firm for all South Korean requisitions. Using the means located in Table 4-4, the mean total unit cost for the AF system is compared to the third party surrogate firm is \$448.98 cheaper. Using the means located in Table 4-7, the mean total unit cost for the AF system is \$38.24 cheaper than the U.S. Navy's FMS procurement system, FASTLINE. Therefore, in relation to the ALC system; the third party surrogate, based on the PROS fill fee matrix, is 81.27 percent more expensive than the Navy's FASTLINE program.

### **Summary**

From the analysis, the lead time performance for a third party firm is superior to the AF ALC procurement system. The results of this research indicate that the total unit prices of FMS requisitions is far more for the third party surrogate than for the ALC system. Also, FMS requisitions supported by the FASTLINE matrix are more than the ALC system; however, that difference is not as great as the third party surrogate. Finally, the results support the findings of the Brown thesis, even though the PROS system was used as a surrogate third party firm and the Brown thesis tested the performance of the NIPARS system, both systems were operated by the same firm (SAIC). Brown concluded that NIPARS lead time was faster than the ALC system but at an increased cost to the FMS customer per procured item.

## **V. Conclusions and Recommendations**

### **Introduction**

This chapter discusses the data analysis and results furnished in Chapter IV. Chapter V will begin with comments and conclusions regarding the ALC procurement system and the third party surrogate procurement system lead times. Next, will be a section discussing both systems' performance dealing with total unit price. Finally, recommendations concerning the use of a third party for all South Korean requisitions will be provided. Also, recommendations for further research will be included.

### **Lead Time Findings**

Based on the information regarding the PROS procurement system, we expected lead time to be much less than the AF ALC standard procurement system even though PROS charges higher unit prices. Surprisingly, the lead time difference between the two systems was not that significant for the matched stock numbers. The surrogate third party firm produced the same results as the two previously mentioned procurement systems when compared to the ALC system.

Investigative Question 1. Lead time performance for supply procurements is the most important factor to the FMS customer. If the FMS customer can reduce the required time for stock replenishment, the customer can reduce the available number of on-hand stocks, thus, reducing inventory capital costs. High levels of on-hand stock are very costly; reducing lead time for supply procurements will allow the FMS customer to reduce the amount of capital invested in inventory. Therefore, total procurement lead time is an important factor to the FMS customer.

The results in Chapter IV do indicate that the average lead time for the ALC system to procure and ship an item is 238.99 days. The third party surrogate firm performs the same service but at a shorter time frame of 224.38 days. An interesting but disturbing observation of these results is that the third party firm only procures 14.6 days faster than the ALC FMS system. The fact that both systems are not significantly different is also proven by comparing the matched stock numbers. The matched stock numbers between the ALC system and the PROS system only have an 11.22 day difference in favor of the PROS system.

The small difference between the ALC system and PROS system and between the ALC system and the third party firm could be the result of three political issues. ALC's could be providing better service to all customers because depots: 1) are being considered for closure, 2) outsourcing and privatization, and 3) how much of the industrial base needs to be kept to support the military services during a contingency. Even with these political issues surrounding the ALCs, one would think a third party firm (i.e. PROS) would have significantly faster lead times. One such reason is that the third party firm receives a fill fee and an award fee for completing each requisition within the contracts specified time period. Not doing so will result in lost profits to the firm; thus, personnel in the third party firm are motivated to ensure the least number of procurements are satisfied outside the contracts lead time criteria. On the flip side, this is not the case for the ALC system. The ALCs do not receive any profit if they satisfy the requisition on time. Another reason a third party firm should have less of a lead time is because the firm would be able to use sources of supply already supported through the ALC system.

The results of the lead time analysis do support the de Kam and Tribble and Brown study of lead time. Although data analysis was conducted differently, their conclusions about NIPARS (which can be considered a surrogate third party firm), is consistent with this research. However, this research does not support, as strongly, that third party firm provides superior lead time performance.

### **Total Unit Price Findings**

Based on the information regarding the PROS procurement system, we expected an increased cost compared to the ALC procurement system. However, with this increased cost we also anticipated faster lead times, which were not evident in our sample. For an additional 14.6 days saved in lead time, the ROK is 20.17 percent more for a third party firm compared to the ALC procurement system.

Investigative Question 2. The purpose of investigative question two was to discover if a commercial organization is more competitive compared to the ALC standard procurement system. The analysis attempted to establish if there is a difference between the average third party price, inclusive of PROS fees, compared to the average total unit price of all items procured through the FMS system. This comparison was achieved by comparing the third party surrogate unit price, to the ALC total unit price, including FMS charges.

There is a significant difference in items procured by the PROS system, the third party surrogate, and FASTLINE when compared to the ALC standard procurement system. The only unit price variable evaluated in this study was the average cost per requisition. The average total unit price for PROS was \$543.34 higher than the ALC

system. The average total unit price for the third party surrogate was \$448.98 higher than the ALC system. The average total unit price for the FASTLINE program was \$38.24 higher than the ALC system. The purpose of this analysis was to compare the price competitiveness of a commercial organization to the AF ALC procurement system. Based on the results, PROS and the third party surrogate are much higher than the ALC system. FASTLINE is only slightly more expensive than the ALC system. This is the result of the supply fill fee matrix. The PROS system and the third party system were based on priority and dollar value of the requisition, thus increasing the total average unit cost significantly. From evaluating the FASTLINE matrix, it is evident that the increased cost of PROS and the third party firm are the result of basing the fill fee on requisition cost. FASTLINE is cheaper because requisitions are only charged based on priority not dollar value.

To evaluate the effects of the final price results on requisition prices, we looked at the fill fee group \$0.00 - \$250.00, which contained 28 requisitions. The average requisition costs for this group was \$23.37. Analyzing the difference between unit price and supply fill fee rate shows the ROK pays \$24.30 more per requisition through PROS or the third party surrogate. However, by using FASTLINE, the ROK only pays \$16.53 more per requisition. If the ROK were to use FASTLINE they would be saving themselves approximately, seven dollars, every time. As item costs increase along the supply fill fee matrix, the ROK pays more under the PROS matrix. However, if a supply fill fee matrix like FASTLINE were used the ROK would be saving money, which may allow them to purchase more inventory stocks.

### **Suggested Fill Fee Rate Model**

If the ROK were to suggest a fill fee matrix based on priority only (not based on requisition value) they could generate savings. Like the FASTLINE model, a three priority matrix should be used. This matrix should include NMCS, urgent, and routine priorities. Also, the fill fee should not be based on requisition value only; therefore, this matrix should keep the same values as FASTLINE; \$143.70, \$61.61, and \$39.90.

Therefore, our suggested model is: NMCS (\$143.70), urgent (\$61.61), and routine (\$39.90). Using this matrix increases the requisition price by 1.89 percent compared to the ALC systems unit price. This price is reasonable considering the lead time savings the ROK is receiving. As the lead time decreases, the fill fees should increase proportionally, as well, to pay for the additional lead time savings.

### **Recommendation**

According to the results in Chapter IV, PROS and our surrogate third party firm cannot respond significantly quicker than the ALC system. This could have a negative impact on the ROK's urgent need for fast requisitions. Unfortunately, the ROK must use the PROS system since it is the current one employed by the USAF. However, if a third party firm or the ALC system could provide faster service at a reduced price this would be advantageous to the ROK. If it is inevitable that the ROK must use the PROS system, it is better to request the requisition under the urgent priority rather than the NMCS priority. Not only will they receive the item faster but it will be a cheaper price. It is possible that a more lucrative procurement source is available as long as it is separated from the ALC system.

## **Conclusion**

Based on the analyzed results PROS, which supported our surrogate third party firm, is successful in cutting lead time compared to the ALC system but at an increased price. In comparison to the ALC system, PROS/surrogate third party firms do provide faster lead times, however significant they are. Cost performance of the PROS/surrogate firm is inferior to the cost performance of the ALC system. However, cost performance between the US Navy's FASTLINE program and the ALC system is not significantly different.

This study did not include the award fees associated to a third party firm. Including the award fees would not significantly change our conclusions. In fact, the total unit price of our surrogate third party firm would only increase.

The concept of foreign military sales is important to the U.S. Department of Defense. It helps to build coalitions and keep depots alive. However, there is a growing trend to shift traditional military follow-on support functions to the commercial sector. This is in due to military budget cutbacks as well as the commercial practices that are faster than military practices. The question is: is PROS or the PROS pricing schedule a good system to use as a surrogate third party firm in the commercial sector?

## **Recommendations for Further Study**

1. Analyze the efficiency of an actual commercial third party firm procurement program for foreign military sales. Compare an actual third party firm to the existing PROS procurement system so an FMS customer can evaluate another procurement option.
2. Does the service and cost provided by AFSAC through the PROS fill fee matrix justify the level of FMS charges currently applied to non-standard procurement.

## **Appendix A. Glossary of Acronyms**

AFMC - Air Force Materiel Command

AECA - Arms Export Control Act

AFSAC - Air Force Security Assistance Command

ALC - Air Logistics Centers

AMC - Air Mobility Command

CLSSA - Cooperative Logistics Supply Support Agreement

CMAL - Controlled Multiple Address Letters

CONDEPOT - Contractor Operated Depot

CONUS - Continental United States

COTS - Commercial off the Shelf

CSIS - Country Standard Item Support

DCS - Direct Commercial Support

DLA - Defense Logistics Agency

DoD - Department of Defense

DTS - Defense Transportation System

FAD - Force Activity Designator

FMS - Foreign Military Sales

IA - Implementing Agency

LOA - Letter of Offer and Acceptance

LOR - Letter of Request

MILSTRIP - Military Standard Requisitioning and Issue Procedures



MSC - Military Sealift Command

MTMC - Military Traffic Management Command

NIPARS - Nonstandard Item Parts Acquisition and Repair System

NISS - Nonstandard Item System Support

NMCS - Not Mission Capable Supply

NSI - Nonstandard Item

O&P - Outsourcing and Privatization

PLT - Production Lead Time

PROS - Parts and Repair Ordering System

RPLT - Requisition Processing Lead Time

RSAF - Royal Saudi Air Force

ROK - Republic of Korea

SA - Security Assistance

SAIC - Science Applications International Corporation

SAIS - Security Assistance Impact Study

SAMIS - Security Assistance Management Information System

SOW - Statement of Work

TPLT - Total Procurement Lead Time

UMMIPS - Uniform Materiel Movement and Issue Priority System

UND - Urgency Need Designator

USG - United States Government

## **Appendix B. Glossary of Terms**

**Air Force Security Assistance Center (AFSAC)** - AFSAC is located at WPAFB, Ohio and is responsible for managing FMS programs for the Air Force and is the program manager for PROS.

**Air Logistics Center (ALC)** - One of five Air Force inventory control points that normally fill FMS requisitions. SAMIS will first send Air Force stock numbered orders to the ALCs for possible fill action before passing them to the PROS contractor. The ALCs also serves as the PROS contractor's source for technical data, when needed to procure an item. Each ALC has a focal point assigned to process these data requests.

**Arms Export Control Act (AECA)** - The basic U.S. law providing the authority and general rules for the conduct of foreign military sales and commercial sales of defense articles, defense services, and training. The AECA came into existence with the passage of the Foreign Military Sales Act (FMSA) of 1968. An amendment in the International Security Assistance and Arms Export Control Act of 1976 changed the name of FMSA to the AECA.

**Commercial off the Shelf (COTS)** - Any items, including those expended or consumed in use which, in addition to military use, are used and traded in normal civilian enterprise and which are, or can be, imported/exported through normal international trade channels.

**Contractor Operated Depot (CONDEPOT)** - A manufacturing facility owned and operated by a private contractor performing a service, under contract, for the USG.

**Force Activity Designator (FAD)** - A Roman numeral (I to V), assigned by the Joint Chiefs of Staff, to show the mission essentially or a unit, organization, installation, project or program to meet national objectives.

**Foreign Liaison Officer** - An official representative, either military or civilian, of a foreign government or international organization stationed in the U.S. to manage or monitor security assistance programs.

**Foreign Military Sales (FMS)** - The selling of military equipment and services to friendly foreign governments and international organizations under the authority of the Foreign Assistance Act of 1961, as amended, and the Arms Export Control Act of 1976, as amended.

**Freight Forwarder** - The agent designated by an SA customer country to complete or control FMS materiel shipment from CONUS or third countries to the purchaser's destination. This is usually a licensed international broker or freight forwarding agent.

**Letter of Offer and Acceptance (LOA)** - U.S. DoD Form 1513 offer and acceptance by which the USG offers to sell to a foreign government or international organization defense articles and defense services pursuant to the Arms Export Control Act, as amended. The form lists the items and/or services, estimated costs, the terms and conditions of sale, and provides for the foreign government's signature to indicate acceptance.

**Letter of Request (LOR)** - A request from an eligible FMS participant country for the purchase of U.S. defense articles and services.

**Military Standard Requisitioning and Issue Procedures (MILSTRIP)** - A DoD standard for automated logistics transactions. It defines a variety of records, differentiated by 3-position document identifier code, and a code used to requisition items and report status.

**Military Standard Transportation and Movement Procedure (MILSTAMP)** - Uniform and standard transportation data, documentation, and control procedures applicable to all cargo movements in the DTS.

**National Stock Number** - A number assigned to each item of supply under the Federal Catalog System. It consists of the 4-digit Federal Supply Class, and 9-digit National Item Identification Number.

**Nonstandard Item (NSI)** - An item of supply determined by standardization actions as not authorized for procurement.

**Nonstandard Item Parts Acquisition and Repair System (NIPARS)** - A contractual agreement between AFSAC and the contractor wherein the contractor provides a purchasing system to full nonstandard item supply and repair/return requisitions. Items covered under this contract include those never used by DoD, those no longer used by DoD, and commercial items with military application.

**Not Mission Capable Supply (NMCS)** - The condition of an item which renders the aircraft, equipment or system inoperable, and maintenance work cannot be performed to return it to an operational condition until the required item(s) of supply become available at the work site.

**Outsourcing** – The transfer of a commercial function which has been performed in-house to an outside provider. Allows the commercial function to retain all control and responsibility by overseeing the service contracts and recurring services.

**Privatization** – The transfer of control and ownership of functions and/or business assets from the public sector to the private sector.

**Parts and Repair Ordering System (PROS)** - A system contracted to an organization responsible for satisfying FMS orders and reporting status similar to the way the ALCs do. The PROS contractor receives MILSTRIP requisitions, reports MILSTRIP status to SAMIS, supplies the required materiel/service and provides invoices that result in billings to the FMS customer. Currently SAIC is the company that is the PROS contractor.

**Parts and Repair Ordering System Fee** - The sum total of all the fees assessed in the processing order.

**Total Procurement Lead Time (TPLT)** - The number of requisitions placed on contract during the quarter within the time frames identified in the award fee plan, divided by the total number of requisitions placed on contract for the entire quarter.

**Security Assistance (SA)** - A group of programs authorized by the Foreign Assistance Act of 1961, as amended, and the Arms Export Control Act of 1976, as amended, or other related statutes by which the U.S. provides defense articles, military training, and other defense-related services, by grant, loan, credit, or cash sales in furtherance of national policies and objectives.

**Security Assistance Management Information System (SAMIS)** - SAMIS is the AFSAC system for managing and accounting for FMS orders. SAMIS transmits electronic orders to the PROS contractor, receives status, approves purchases (except where additional customer approval is mandated), accepts invoices and interfaces with the FMS customer. As such, SAMIS acts as the official instrument AFSAC uses to manage the PROS contract.

**Uniform Materiel Movement and Issue Priority System (UMMIPS)** - Provides the basis for determining the relative importance of an item that is backordered by FMS supply from its wholesale source of supply. The system, in order to facilitate efficient requisitioning and materiel movement, uses a two digit numeric code (01 to 15) called a priority designator.

**Urgency Need Designator (UND)** - Indicates how urgently the organization requires the materiel ordered. The letters A, B, and C expresses the varying degree of urgency. UND A represents the highest need (cannot perform mission) followed in importance by UND B and UND C.

**Appendix C: Sample of PROS NSNs**

STOCK NUMBER	DATE SHIPPED	DATE PROCESS SAMIS	LEAD TIME	PRIORITY	UNIT PRICE
1005006764059	23-APR-97	05-FEB-97	77	3	\$4,187.60
1560006136501LG	27-DEC-96	16-DEC-95	377	6	\$4,085.87
1560008903703XX	03-OCT-96	05-APR-96	181	12	\$12,797.99
1560012653848XW	06-NOV-96	18-JUL-96	111	6	\$4,238.84
1560013584791XV	26-FEB-97	26-DEC-96	62	2	\$381.74
1560013965664XW	13-NOV-96	22-JUL-96	114	6	\$111.54
1560013965667XW	30-DEC-96	25-JUN-96	188	6	\$931.50
1560013965670XW	13-NOV-96	22-JUL-96	114	6	\$116.70
1560013969207XW	28-FEB-97	22-JUL-96	221	6	\$198.62
1560013970167XW	27-DEC-96	25-JUN-96	185	6	\$1,309.67
1560014078996XW	06-JAN-97	22-JUL-96	168	6	\$4,908.84
1560014079001XW	17-JAN-97	02-JUL-96	199	6	\$238.57
1560014164296XW	07-OCT-96	25-JUN-96	104	6	\$1,586.06
1560014236026XW	28-JAN-97	04-JUN-96	238	3	\$1,242.32
1610006513887	26-FEB-97	13-DEC-96	75	2	\$850.30
1610006781107	31-OCT-96	12-FEB-96	262	3	\$63.27
1610008736251	23-MAY-97	07-NOV-96	197	3	\$7,100.62
1610011669359	07-MAY-97	16-OCT-96	203	3	\$18,716.70
1620000094247	20-MAR-97	12-SEP-96	189	3	\$302.99
1620000228712	19-DEC-96	25-JUN-96	177	3	\$476.14
1620002592828	27-DEC-96	15-OCT-96	73	3	\$102.81
1620010446149	23-APR-97	07-JAN-97	106	13	\$508.83
1620010492910	28-FEB-97	19-JUL-96	224	6	\$1,192.11
1620010568922	17-JUN-97	04-MAR-97	105	3	\$36.41
1620010569668	14-APR-97	09-JAN-97	95	6	\$100.42
1620010571761	25-MAR-97	07-JAN-97	77	13	\$16.30
1620010590516	17-JUN-97	04-MAR-97	105	3	\$241.89
1620010596872	13-JAN-97	19-JUL-96	178	6	\$62.97
1620010607203	15-APR-97	05-DEC-96	131	6	\$48.83
1620010714841	16-JAN-97	19-JUL-96	181	6	\$1,930.82
1620010736293	05-JUN-97	04-MAR-97	93	3	\$70.27
1620010736820	17-APR-97	10-JUL-96	281	12	\$55.94
1620010736853	16-MAY-97	19-JUL-96	301	6	\$976.40
1620012561974	17-JAN-97	26-SEP-96	113	6	\$846.05

STOCK NUMBER	DATE SHIPPED	DATE PROCESS SAMIS	LEAD TIME	PRIORITY	UNIT PRICE
1620012571271	16-APR-97	07-JAN-97	99	6	\$105.76
1630000314395	08-MAY-97	27-FEB-97	70	3	\$16.80
1630000326102	14-MAR-97	01-OCT-96	164	3	\$282.24
1630007551334LE	14-MAR-97	07-FEB-97	35	6	\$304.57
1630009496772	11-JUN-97	09-JAN-97	153	3	\$680.14
1630010385126	17-MAR-97	22-JUL-96	238	13	\$7,852.00
1630010520826	17-JUN-97	04-DEC-96	195	3	\$29.58
1630010525340	03-JUN-97	27-FEB-97	96	3	\$208.73
1630011862476	23-MAY-97	10-DEC-96	164	3	\$63.66
1630011862478	09-JUN-97	10-DEC-96	181	3	\$143.68
1630013314868	02-JUN-97	02-JAN-97	151	6	\$17.16
1630013325496	21-MAY-97	19-SEP-96	244	13	\$21.58
1650000657688	11-NOV-96	15-MAR-96	241	6	\$14,640.64
1650002265787	18-APR-97	07-MAY-96	346	6	\$2,388.22
1650004338592	24-FEB-97	24-APR-96	306	6	\$843.20
1650006109123	10-JAN-97	16-MAY-96	239	3	\$1,815.43
1650007302850	24-JAN-97	27-DEC-95	394	13	\$3,342.45
1650010134127	30-MAY-97	07-MAR-97	84	3	\$539.39
1650010586259	06-JUN-97	31-JAN-96	492	3	\$6,577.55
1650011390177	03-APR-97	12-JAN-96	447	3	\$4,290.65
1650012289276	11-DEC-96	10-OCT-96	62	3	\$46,053.49
1650012320561	04-APR-97	06-SEP-94	941	3	\$26,489.51
1660000620301	06-MAR-97	22-OCT-96	135	2	\$5,093.17
1660003220847BO	10-FEB-97	21-MAY-96	265	3	\$3,224.49
1660003434692	11-OCT-96	14-SEP-95	393	3	\$9,558.54
1660003494060	05-FEB-97	26-SEP-96	132	3	\$1,424.05
1660008861410XV	28-MAR-97	27-FEB-97	29	12	\$314.95
1660008974306	14-FEB-97	04-NOV-96	102	2	\$19,179.64
1660011887232FX	12-JUN-97	24-FEB-97	108	6	\$223.47
1670010972204XW	12-MAY-97	26-FEB-97	75	3	\$3,115.88
1680007899345HS	11-NOV-96	10-JUL-96	124	6	\$2,964.04
1680011817728XW	20-DEC-96	26-SEP-96	85	6	\$248.16
1680013969100XW	06-NOV-96	19-JUL-96	110	6	\$788.45
1680013969206XW	22-OCT-96	22-JUL-96	92	6	\$439.47
1680013969210XW	15-OCT-96	19-JUL-96	88	6	\$2,558.44
1680013970494XW	09-APR-97	19-JUL-96	264	6	\$2,237.89
1680013972014XW	18-APR-97	19-JUL-96	273	6	\$236.95

STOCK NUMBER	DATE SHIPPED	DATE PROCESS SAMIS	LEAD TIME	PRIORITY	UNIT PRICE
1680013972016XW	09-OCT-96	19-JUL-96	82	6	\$222.08
1730000458175	23-APR-97	23-JAN-95	821	3	\$1,134.71
2620011422461	24-FEB-97	17-SEP-96	160	6	\$4.43
2805006749414	27-JUN-97	02-APR-97	86	6	\$798.95
2810004225432PA	05-DEC-96	11-OCT-96	55	6	\$53.50
2840005907205RW	20-FEB-97	13-NOV-96	99	2	\$309.57
2840010152432PL	24-MAR-97	22-APR-96	336	6	\$6,792.93
2840010934592PL	16-JUN-97	26-SEP-96	263	6	\$32,079.23
2840011911895PR	24-JUN-97	16-OCT-96	251	3	\$1,033.34
2840012005337PR	24-JUN-97	27-MAR-96	454	6	\$2,495.42
2840012051304PT	06-NOV-96	29-FEB-96	251	3	\$3,679.54
2840012539193RW	06-DEC-96	19-DEC-95	353	2	\$1,447.17
2840013571941PR	10-JAN-97	25-APR-96	260	3	\$4,458.16
2915006551933RW	27-FEB-97	26-JAN-96	398	6	\$2,269.63
2915007779017RW	30-DEC-96	12-AUG-96	140	6	\$4,052.26
2915012665925PR	11-NOV-96	08-MAY-96	187	3	\$341.66
2925008596815RW	11-FEB-97	12-MAR-96	336	6	\$7,894.04
2925011485810PN	06-NOV-96	31-AUG-95	433	6	\$3,454.01
2925012949823PR	23-APR-97	02-JAN-97	111	6	\$2,402.82
2995007986598PL	21-JAN-97	10-OCT-96	103	13	\$345.99
3040000110704RX	10-MAR-97	20-NOV-95	476	3	\$6,194.11
3110011252570PE	03-APR-97	16-DEC-96	108	3	\$397.27
3120003565718LE	24-MAR-97	21-JAN-97	62	6	\$137.15
3120010582277LE	08-APR-97	22-JUL-96	260	6	\$105.14
3120010592035LE	24-MAR-97	24-DEC-96	90	3	\$67.40
3120010962595LE	29-MAY-97	14-APR-97	45	3	\$1.22
3120011441287LE	19-MAR-97	30-AUG-96	201	6	\$138.48
3120012575162LE	20-FEB-97	26-SEP-96	147	6	\$173.13
3120012685706LE	20-MAY-97	05-DEC-96	166	3	\$134.53
3120013161986LE	21-FEB-97	08-DEC-96	75	3	\$79.33
3120014178527XW	11-DEC-96	26-SEP-96	76	6	\$51.97
3940007630104NM	20-FEB-97	23-JAN-96	394	6	\$162.98
4320000620511HS	10-APR-97	05-JUN-96	309	13	\$9,143.86
4320004637715HS	30-JAN-97	21-NOV-96	70	6	\$701.58
4320010104083	17-JUN-97	07-FEB-97	130	6	\$1,051.02
4320011405786XV	20-FEB-97	18-DEC-96	64	6	\$294.04
4430011603423	03-OCT-96	13-FEB-96	233	8	\$4,149.17

STOCK NUMBER	DATE SHIPPED	DATE PROCESS SAMIS	LEAD TIME	PRIORITY	UNIT PRICE
4710005150330	23-JAN-97	12-AUG-96	164	3	\$260.86
4710006760544LG	21-OCT-96	07-DEC-95	319	6	\$116.44
4710012633378LG	29-APR-97	14-MAR-97	46	3	\$182.71
4720001828948	20-FEB-97	25-SEP-96	148	6	\$53.12
4730013329699LE	04-JUN-97	10-APR-97	55	3	\$8.96
4810002327931HS	06-DEC-96	19-JUL-96	140	6	\$2,604.73
4810006732727YQ	23-MAY-97	13-MAR-97	71	3	\$7,462.71
4810007569892HS	15-MAY-97	26-DEC-96	140	3	\$675.04
4810008668212HS	11-MAR-97	10-FEB-97	29	3	\$2,616.95
4920013088886	27-JAN-97	11-JUL-96	200	3	\$2,592.78
4933010688007	19-MAY-97	24-OCT-96	207	13	\$1,156.91
5120001106438	10-MAR-97	07-JAN-97	62	3	\$130.17
5120001883652	19-FEB-97	09-SEP-96	163	3	\$530.12
5120003031046	18-MAR-97	15-OCT-96	154	13	\$630.18
5120004692186	17-DEC-96	24-OCT-96	54	6	\$1,052.96
5120005110205	11-FEB-97	12-JUN-96	244	13	\$601.26
5120008630426	10-APR-97	22-AUG-96	231	3	\$1,204.83
5120010403519	12-MAR-97	25-OCT-96	138	6	\$338.78
5120011105899	17-JUN-97	13-JAN-97	155	3	\$1,391.67
5120011984893	07-JAN-97	29-JUL-96	162	13	\$107.61
5120012698074	16-JAN-97	07-MAY-96	254	3	\$696.84
5180010348998	15-MAY-97	15-JAN-97	120	6	\$1,635.39
5180010399893	07-FEB-97	19-AUG-96	172	3	\$964.85
5180010405082	01-APR-97	09-JAN-97	82	3	\$1,279.60
5180010530497	06-FEB-97	25-OCT-96	104	6	\$2,004.93
5180010593758	07-MAY-97	25-OCT-96	194	6	\$44,907.28
5180010649443	18-MAR-97	22-JAN-97	55	3	\$671.39
5180010649446	14-MAY-97	25-OCT-96	201	6	\$647.76
5180010649447	01-MAY-97	25-OCT-96	188	6	\$879.27
5180010649448	14-MAY-97	25-OCT-96	201	6	\$884.16
5180010819622	25-MAR-97	09-JAN-97	75	3	\$1,319.22
5180013086138WF	17-OCT-96	15-APR-96	185	6	\$4,479.57
5180013748266	02-MAY-97	24-OCT-96	190	6	\$59,024.53
5210010653112	01-MAY-97	15-JAN-97	106	3	\$1,409.43
5220006891768GG	08-APR-97	05-MAR-97	34	3	\$2,263.50
5305013965233XW	17-JAN-97	29-JUL-96	172	6	\$31.73
5305014132023XW	03-OCT-96	29-JUL-96	66	6	\$10.50



STOCK NUMBER	DATE SHIPPED	DATE PROCESS SAMIS	LEAD TIME	PRIORITY	UNIT PRICE
5306010516032LE	30-JUN-97	08-DEC-96	204	3	\$39.26
5306010731883LE	20-JUN-97	24-JUL-95	697	13	\$373.04
5306013992411XW	09-OCT-96	29-JUL-96	72	6	\$1,019.76
5306013992413XW	11-OCT-96	29-JUL-96	74	6	\$578.97
5306013994964XW	05-NOV-96	29-JUL-96	99	6	\$795.89
5310010562170LE	23-MAY-97	04-MAR-97	80	3	\$67.53
5310010592300LE	29-JAN-97	29-JUL-96	184	6	\$34.15
5310010596373LE	08-MAY-97	04-MAR-97	65	3	\$390.85
5315010732010LE	11-JUN-97	30-JUL-96	316	6	\$163.84
5315010732011LE	11-JUN-97	30-JUL-96	316	6	\$96.38
5315010743114LE	19-JUN-97	30-JUL-96	324	6	\$36.77
5315010753006LE	11-JUN-97	30-JUL-96	316	6	\$96.38
5315013209689LE	17-APR-97	04-DEC-96	134	3	\$74.24
5315014116282XW	06-MAR-97	30-JUL-96	219	6	\$231.50
5315014117684XW	07-NOV-96	02-JUL-96	128	6	\$287.94
5330009823692PQ	01-APR-97	31-DEC-96	91	2	\$86.79
5330010513559LE	23-MAY-97	04-DEC-96	170	3	\$72.20
5330010551207LE	15-MAY-97	09-JAN-97	126	6	\$2.51
5330010559764LE	15-APR-97	09-JAN-97	96	6	\$26.84
5330011315010LE	16-MAY-97	12-MAR-97	65	13	\$21.26
5330011822857JF	29-MAY-97	08-MAR-96	447	3	\$194.47
5330013008653LG	19-MAR-97	07-AUG-96	224	3	\$20.38
5340011158971LE	12-MAY-97	04-MAR-97	69	3	\$53.17
5340013140969AL	06-JAN-97	15-NOV-96	52	6	\$147.46
5340014182236XW	24-JAN-97	26-SEP-96	120	6	\$1,545.92
5360007985053LG	01-MAY-97	21-MAR-97	41	6	\$17.87
5360010568656LE	23-MAY-97	10-DEC-96	164	3	\$26.50
5365010545622LE	14-MAY-97	04-DEC-96	161	3	\$67.09
5365010569670LE	23-APR-97	30-JUL-96	267	6	\$119.43
5365010571089LE	07-FEB-97	09-DEC-96	60	3	\$17.62
5365010571186LE	02-JUN-97	30-JUL-96	307	6	\$16.56
5365010575891LE	14-MAR-97	09-DEC-96	95	3	\$75.09
5365010589954LE	19-FEB-97	10-DEC-96	71	6	\$21.00
5821010925211	24-APR-97	30-AUG-96	237	13	\$1,153.37
5821011029078	23-JUN-97	14-AUG-96	313	3	\$2,362.90
5826009859174	29-JAN-97	05-SEP-96	146	3	\$458.16
5831005391714	20-JUN-97	28-DEC-96	174	13	\$5,075.49

STOCK NUMBER	DATE SHIPPED	DATE PROCESS SAMIS	LEAD TIME	PRIORITY	UNIT PRICE
5836013518459SN	10-APR-97	28-MAR-96	378	3	\$1,433.46
5895000898010	01-APR-97	21-NOV-96	131	6	\$1,482.78
5905012810630LE	12-MAR-97	07-FEB-97	33	6	\$814.09
5915012843181XY	20-MAY-97	18-FEB-97	91	12	\$83.26
5930010637155ZK	27-FEB-97	18-NOV-96	101	13	\$459.97
5930012544245XY	17-MAR-97	07-JAN-97	69	5	\$9.01
5935012950656YM	11-FEB-97	22-OCT-96	112	3	\$2,460.90
5935013051984XW	26-FEB-97	30-JUL-96	211	6	\$189.11
5945014071572XW	01-APR-97	09-MAR-97	23	13	\$16.13
5996008803562CX	13-JUN-97	19-DEC-96	176	6	\$632.75
5998003329317CX	28-MAY-97	19-FEB-97	98	3	\$1,528.37
5998012211301JZ	03-OCT-96	18-JUN-96	107	6	\$721.45
5998012864410XY	20-MAY-97	18-MAR-97	63	6	\$161.30
5998013732835NT	04-APR-97	12-OCT-95	540	3	\$3,625.33
6130010323966CX	03-MAR-97	24-APR-96	313	3	\$20,590.52
6130010761668BY	24-JUN-97	19-MAR-97	97	3	\$808.10
6130013549306NT	23-APR-97	17-JAN-96	462	3	\$4,993.52
6150012344105LG	25-MAR-97	05-JUN-96	293	3	\$2,748.14
6610005679306	30-JUN-97	08-MAY-96	418	3	\$14,403.67

**Appendix D: Sample of ALC NSNs**

STOCK NUMBER	DATE SHIPPED	DATE PROCESS SAMIS	LEAD TIME	PRIORITY	UNIT PRICE
1005006764059	24-JAN-97	12-DEC-96	43	3	\$4,723.92
1560006136501LG	14-MAR-97	04-NOV-96	130	6	\$8,450.16
1560008903703XX	08-JAN-97	03-DEC-89	2593	6	\$17,061.76
1560012653848XW	16-APR-97	18-OCT-96	180	3	\$606.34
1560013584791XV	15-MAY-97	25-SEP-96	232	5	\$125.02
1560013965664XW	02-MAY-97	18-OCT-96	196	3	\$66.70
1560013965667XW	19-MAR-97	18-OCT-96	152	3	\$574.33
1560013965670XW	16-APR-97	18-OCT-96	180	3	\$80.31
1560013969207XW	16-APR-97	18-OCT-96	180	3	\$162.60
1560013970167XW	21-NOV-96	30-MAY-95	541	6	\$829.01
1560014078996XW	12-NOV-96	20-APR-95	572	6	\$1,352.02
1560014079001XW	10-DEC-96	20-APR-95	600	6	\$102.85
1560014164296XW	16-APR-97	12-MAR-96	400	3	\$320.52
1560014236026XW	03-DEC-96	18-MAR-96	260	3	\$1,267.31
1610006513887	10-DEC-96	09-DEC-96	1	2	\$266.85
1610006781107	04-DEC-96	07-MAY-96	211	5	\$30.11
1610008736251	18-DEC-96	12-AUG-96	128	6	\$10,427.24
1610011669359	25-JAN-97	14-MAY-96	256	3	\$13,685.00
1620000094247	01-MAY-97	22-JUL-96	283	6	\$262.93
1620000228712	31-DEC-96	28-DEC-96	3	6	\$192.91
1620002592828	18-APR-97	16-MAR-97	33	3	\$87.39
1620010446149	10-MAR-97	04-MAR-97	6	3	\$276.32
1620010492910	07-NOV-96	07-APR-94	945	13	\$1,456.61
1620010568922	29-OCT-96	16-OCT-96	13	5	\$6.65
1620010569668	10-MAR-97	27-FEB-97	11	3	\$28.75
1620010571761	17-JUN-97	17-MAY-97	31	3	\$13.40
1620010590516	02-MAY-97	19-JUL-96	287	6	\$145.00
1620010596872	03-DEC-96	27-JUN-96	159	2	\$60.61
1620010607203	10-MAR-97	04-MAR-97	6	3	\$25.81
1620010714841	02-JUN-97	23-MAY-96	375	2	\$1,356.00
1620010736293	17-JUN-97	17-MAY-97	31	3	\$16.52
1620010736820	11-APR-97	11-MAR-97	31	13	\$244.69
1620010736853	22-MAY-97	04-OCT-95	596	3	\$568.80

STOCK NUMBER	DATE SHIPPED	DATE PROCESS SAMIS	LEAD TIME	PRIORITY	UNIT PRICE
1620012561974	13-JUN-97	17-MAY-97	27	3	\$823.86
1620012571271	13-JUN-97	17-MAY-97	27	3	\$11.00
1630000314395	15-OCT-96	10-OCT-96	5	12	\$3.58
1630000326102	29-JAN-97	29-SEP-96	122	5	\$65.62
1630007551334LE	12-FEB-97	03-JAN-97	40	6	\$96.14
1630009496772	16-MAY-97	05-FEB-97	100	6	\$225.04
1630010385126	31-MAY-97	15-APR-97	46	3	\$4,542.38
1630010520826	16-JUN-97	14-APR-97	63	3	\$2.54
1630010525340	22-NOV-96	10-SEP-96	73	3	\$62.67
1630011862476	11-APR-97	27-FEB-97	43	3	\$14.37
1630011862478	03-JUN-97	10-FEB-97	113	6	\$27.73
1630013314868	13-JUN-97	31-DEC-96	164	6	\$11.45
1630013325496	26-JUN-97	22-JUL-96	339	13	\$5.79
1650000657688	16-MAR-97	21-JAN-97	54	6	\$12,940.57
1650002265787	21-DEC-96	19-DEC-96	2	3	\$538.00
1650004338592	31-OCT-96	13-FEB-96	261	13	\$749.12
1650006109123	07-NOV-96	26-AUG-96	73	3	\$1,817.73
1650007302850	03-DEC-96	13-APR-95	600	3	\$6,746.00
1650010134127	28-OCT-96	25-OCT-96	3	3	\$589.17
1650010586259	02-JUN-97	04-OCT-95	607	3	\$7,666.88
1650011390177	30-JAN-97	24-JAN-97	6	2	\$1,583.68
1650012289276	19-DEC-96	26-SEP-96	84	6	\$44,926.59
1650012320561	21-MAY-97	08-OCT-93	1321	2	\$6,921.77
1660000620301	20-APR-97	04-APR-97	16	3	\$4,263.70
1660003220847BO	07-MAR-97	04-MAR-97	3	6	\$1,884.61
1660003434692	09-JAN-97	29-AUG-96	133	3	\$18,344.05
1660003494060XV	03-OCT-96	12-JUN-95	479	3	\$1,681.00
1660008861410XV	15-FEB-97	06-FEB-97	9	12	\$98.27
1660008974306	02-MAY-97	08-APR-97	24	3	\$10,432.44
1660011887232FX	11-APR-97	07-APR-97	4	6	\$169.35
1670010972204XW	09-JUN-97	15-JAN-97	145	3	\$1,216.33
1680007899345HS	22-MAY-97	21-OCT-96	213	2	\$8,297.52
1680011817728XW	16-APR-97	18-OCT-96	180	3	\$41.71
1680013969100XW	16-APR-97	18-OCT-96	180	3	\$57.04
1680013969206XW	16-APR-97	18-OCT-96	180	3	\$11.38

STOCK NUMBER	DATE SHIPPED	DATE PROCESS SAMIS	LEAD TIME	PRIORITY	UNIT PRICE
1680013969210XW	16-APR-97	18-OCT-96	180	3	\$468.50
1680013970494XW	16-APR-97	12-MAR-96	400	3	\$34.66
1680013972014XW	15-FEB-97	12-MAR-96	340	3	\$8.66
1680013972016XW	16-APR-97	12-MAR-96	400	3	\$44.93
1730000458175	05-OCT-96	16-SEP-96	19	3	\$551.00
2620011426461	14-JAN-97	30-SEP-96	106	6	\$269.50
2805006749414	17-JAN-97	10-DEC-96	38	6	\$1,847.88
2810004225432PA	04-OCT-96	02-OCT-96	2	6	\$49.13
2840005907205RW	15-MAR-97	21-NOV-96	114	6	\$63.87
2840010152432PL	04-JUN-97	08-APR-96	422	3	\$1,922.91
2840010934592PL	25-OCT-96	11-JUL-96	106	6	\$26,357.64
2840011911895PR	13-FEB-97	06-FEB-97	7	3	\$694.19
2840012005337PR	12-MAY-97	09-JUL-96	307	3	\$1,645.00
2840012051304PT	21-OCT-96	17-JAN-96	278	3	\$1,541.00
2840012539193RW	04-NOV-96	19-DEC-95	321	2	\$1,227.13
2840013571941PR	05-FEB-97	09-MAY-95	638	6	\$2,714.06
2915006551933RW	28-FEB-97	17-DEC-96	73	6	\$1,443.73
2915007779017RW	10-JAN-97	20-DEC-96	21	6	\$4,636.32
2915012665925PR	06-MAR-97	07-NOV-94	850	3	\$197.00
2925008596815RW	24-APR-97	08-APR-97	16	6	\$2,609.02
2925011485810PN	26-NOV-96	22-NOV-96	4	5	\$4,494.87
2925012949823PR	14-MAR-97	20-FEB-97	22	3	\$2,214.73
2995007986598PL	11-OCT-96	09-OCT-96	2	6	\$435.14
3040000110704RX	31-OCT-96	08-MAR-96	237	3	\$7,328.01
3110011252570PE	09-FEB-97	17-SEP-96	145	6	\$528.84
3120003565718LE	03-OCT-96	27-AUG-96	37	6	\$72.54
3120010582277LE	10-MAR-97	04-MAR-97	6	3	\$106.35
3120010592035LE	04-JUN-97	26-MAY-97	9	13	\$20.97
3120010962595LE	15-MAR-97	04-MAR-97	11	3	\$0.76
3120011441287LE	05-DEC-96	06-AUG-96	121	6	\$141.01
3120012575162LE	01-OCT-96	04-OCT-95	363	3	\$15.68
3120012685706LE	16-DEC-96	29-NOV-96	17	2	\$10.69
3120013161986LE	23-FEB-97	06-NOV-96	109	2	\$3.08
3120014178527XW	28-FEB-97	06-DEC-95	450	6	\$60.41
3940007630104NM	26-JUN-97	20-DEC-96	188	6	\$554.00

STOCK NUMBER	DATE SHIPPED	DATE PROCESS SAMIS	LEAD TIME	PRIORITY	UNIT PRICE
4320000620511HS	24-APR-97	05-JUN-96	323	2	\$7,979.32
4320004637715HS	31-OCT-96	19-SEP-96	42	6	\$793.51
4320010104083	08-OCT-96	30-JUL-96	70	6	\$649.67
4320011405786XV	12-DEC-96	06-DEC-96	6	6	\$135.46
4430011603423	07-OCT-96	02-JAN-96	279	3	\$3,788.00
4710005150330PT	12-MAY-97	29-APR-97	13	3	\$382.18
4710006760544LG	10-OCT-96	10-JAN-96	274	3	\$47.08
4710012633378LG	12-NOV-96	07-NOV-96	5	15	\$141.99
4720001828948	30-DEC-96	01-AUG-96	151	13	\$107.60
4730013329699LE	17-JUN-97	17-MAY-97	31	3	\$7.37
4810002327931HS	26-FEB-97	10-DEC-96	78	6	\$1,852.54
4810006732727YQ	29-MAY-97	06-FEB-97	112	2	\$3,650.80
4810007569892HS	10-OCT-96	22-AUG-96	49	13	\$3,531.23
4810008668212HS	04-NOV-96	11-OCT-96	24	3	\$2,018.45
4920013088886	15-JAN-97	18-SEP-96	119	3	\$25.00
4933010688007	10-DEC-96	16-APR-96	238	6	\$445.11
5120001106438	12-MAY-97	26-NOV-96	167	3	\$63.00
5120001883652	30-JAN-97	08-APR-96	297	3	\$530.12
5120003031046	10-DEC-96	02-APR-96	252	13	\$544.74
5120004692186	05-MAY-97	26-NOV-96	160	3	\$1,043.18
5120005110205	21-OCT-96	15-OCT-96	6	13	\$1,176.62
5120008630426	23-JAN-97	26-JUL-95	547	8	\$272.89
5120010403519	28-MAY-97	23-MAY-97	5	3	\$46.53
5120011105899	29-OCT-96	10-JAN-95	658	6	\$563.87
5120011984893	29-OCT-96	29-DEC-94	670	3	\$299.50
5120012698074	05-JUN-97	29-MAY-97	7	3	\$551.05
5180010348998	08-JAN-97	12-APR-96	271	6	\$1,830.60
5180010399893	01-OCT-96	15-APR-96	169	6	\$593.31
5180010405082	30-APR-97	10-DEC-96	141	3	\$925.00
5180010530497	02-DEC-96	15-APR-96	231	6	\$1,737.11
5180010593758	05-DEC-96	15-APR-96	234	6	\$41,762.33
5180010649443	02-DEC-96	26-NOV-96	6	3	\$315.59
5180010649446	20-DEC-96	16-APR-96	248	6	\$470.18
5180010649447	18-DEC-96	16-APR-96	246	6	\$671.68
5180010649448	18-DEC-96	16-APR-96	246	6	\$740.01

STOCK NUMBER	DATE SHIPPED	DATE PROCESS SAMIS	LEAD TIME	PRIORITY	UNIT PRICE
5180010819622	02-DEC-96	26-NOV-96	6	3	\$1,004.25
5180013086138WF	24-OCT-96	16-SEP-96	38	3	\$2,888.00
5180013748266	03-MAR-97	01-JUL-96	245	6	\$49,814.00
5210010653112	27-FEB-97	15-APR-96	318	6	\$800.68
5220006891768GG	19-DEC-96	10-APR-96	253	6	\$1,202.75
5305013965233XW	10-DEC-96	10-APR-96	244	3	\$1.34
5305014132023XW	15-OCT-96	14-AUG-95	428	6	\$16.07
5306010516032LE	13-FEB-97	29-JAN-97	15	6	\$5.74
5306010731883LE	10-MAR-97	04-MAR-97	6	3	\$49.11
5306013992411XW	10-DEC-96	11-APR-96	243	3	\$338.52
5306013992413XW	21-NOV-96	11-APR-96	224	3	\$488.70
5306013994964XW	21-NOV-96	11-APR-96	224	3	\$365.97
5310010562170LE	20-NOV-96	06-NOV-96	14	15	\$22.69
5310010592300LE	13-JUN-97	17-MAY-97	27	3	\$12.79
5310010596373LE	25-FEB-97	14-JUN-96	256	2	\$60.96
5315010732010LE	10-MAR-97	04-MAR-97	6	3	\$41.55
5315010732011LE	20-DEC-96	06-NOV-96	44	5	\$43.24
5315010743114LE	13-JUN-97	17-MAY-97	27	3	\$29.60
5315010753006LE	20-DEC-96	22-APR-96	242	6	\$78.21
5315013209689LE	26-MAY-97	06-NOV-96	201	12	\$34.22
5315014116282XW	12-NOV-96	03-AUG-95	467	6	\$123.45
5315014117684XW	12-NOV-96	02-AUG-95	468	6	\$176.08
5330009823692PQ	11-JUN-97	11-APR-97	61	6	\$10.21
5330010513559LE	26-MAR-97	25-NOV-96	121	13	\$12.33
5330010551207LE	07-MAR-97	09-JAN-97	57	6	\$1.96
5330010559764LE	15-FEB-97	05-FEB-97	10	6	\$4.41
5330011315010LE	25-NOV-96	06-NOV-96	19	13	\$16.55
5330011822857JF	12-FEB-97	10-FEB-97	2	6	\$207.76
5330013008653LG	17-OCT-96	11-MAR-96	220	2	\$6.02
5340011158971LE	24-APR-97	14-APR-97	10	12	\$9.58
5340013140969AL	05-APR-97	16-JAN-97	79	3	\$10.20
5340014182236XW	16-APR-97	06-DEC-95	497	6	\$325.33
5360007985053LG	23-MAY-97	21-MAY-97	2	3	\$8.46
5360010568656LE	21-JAN-97	16-OCT-95	463	6	\$12.41
5365010545622LE	12-NOV-96	31-OCT-96	12	5	\$8.65

STOCK NUMBER	DATE SHIPPED	DATE PROCESS SAMIS	LEAD TIME	PRIORITY	UNIT PRICE
5365010569670LE	10-MAR-97	04-MAR-97	6	3	\$31.85
5365010571089LE	29-MAR-97	24-MAR-97	5	13	\$6.35
5365010571186LE	09-MAR-97	04-MAR-97	5	3	\$4.40
5365010575891LE	30-OCT-96	30-JUL-96	92	6	\$11.01
5365010589954LE	21-DEC-96	04-OCT-95	444	3	\$0.60
5821010925211	05-DEC-96	26-AUG-96	101	6	\$901.43
5821011029078	08-APR-97	13-NOV-96	146	3	\$691.33
5826009859174	12-NOV-96	09-NOV-96	3	3	\$2,586.00
5831005391714	08-NOV-96	11-OCT-96	28	3	\$4,311.92
5836013518459SN	01-JAN-97	26-DEC-96	6	3	\$1,526.14
5895000898010	10-FEB-97	09-OCT-96	124	6	\$678.00
5905012810630LE	06-DEC-96	22-NOV-96	14	5	\$442.02
5915012843181XY	11-JAN-97	07-JAN-97	4	5	\$22.55
5930010637155ZK	06-APR-97	25-FEB-97	40	6	\$289.54
5930012544245XY	31-JAN-97	19-JAN-96	378	2	\$10.56
5935012950656YM	06-DEC-96	10-APR-96	240	6	\$2,143.00
5935013051984XW	16-APR-97	28-OCT-96	170	3	\$17.77
5945014071572XW	06-JAN-97	20-APR-95	627	6	\$54.25
5996008803562CX	27-FEB-97	09-SEP-96	171	13	\$340.23
5998003329317CX	20-DEC-96	04-DEC-96	16	3	\$1,215.03
5998012211301JZ	05-APR-97	22-JAN-97	73	5	\$735.82
5998012864410XY	04-NOV-96	31-OCT-96	4	3	\$241.05
5998013732835NT	04-NOV-96	22-MAR-95	593	3	\$1,544.00
6130010323966CX	15-JUN-97	12-JUN-97	3	6	\$4,600.80
6130010761668BY	13-NOV-96	30-OCT-95	380	3	\$1,033.56
6130013549306NT	09-APR-97	14-MAR-95	757	2	\$5,506.00
6150012344105LG	31-OCT-96	13-DEC-95	323	6	\$2,209.87
6610005679306	10-DEC-96	28-NOV-94	743	6	\$12,113.22



### Appendix E: Random Sample of Completed NSNs

STOCK NUMBER	DATE SHIPPED	DATE PROCESS SAMIS	LEAD TIME	PRIORITY	UNIT PRICE
3120013161986LE	23-FEB-97	06-NOV-96	109	2	\$3.08
5330013008653LG	17-OCT-96	11-MAR-96	220	2	\$6.02
5930012544245XY	31-JAN-97	19-JAN-96	378	2	\$10.56
3120012685706LE	16-DEC-96	29-NOV-96	17	2	\$10.69
1620010596872	03-DEC-96	27-JUN-96	159	2	\$60.61
5310010596373LE	25-FEB-97	14-JUN-96	256	2	\$60.96
5365010589954LE	21-DEC-96	04-OCT-95	444	3	\$0.60
3120010962595LE	15-MAR-97	04-MAR-97	11	3	\$0.76
5305013965233XW	10-DEC-96	10-APR-96	244	3	\$1.34
1630010520826	16-JUN-97	14-APR-97	63	3	\$2.54
5365010571186LE	09-MAR-97	04-MAR-97	5	3	\$4.40
4730013329699LE	17-JUN-97	17-MAY-97	31	3	\$7.37
5360007985053LG	23-MAY-97	21-MAY-97	2	3	\$8.46
1680013972014XW	15-FEB-97	12-MAR-96	340	3	\$8.66
5340013140969AL	05-APR-97	16-JAN-97	79	3	\$10.20
1620012571271	13-JUN-97	17-MAY-97	27	3	\$11.00
1680013969206XW	16-APR-97	18-OCT-96	180	3	\$11.38
5310010592300LE	13-JUN-97	17-MAY-97	27	3	\$12.79
1620010571761	17-JUN-97	17-MAY-97	31	3	\$13.40
1630011862476	11-APR-97	27-FEB-97	43	3	\$14.37
3120012575162LE	01-OCT-96	04-OCT-95	363	3	\$15.68
1620010736293	17-JUN-97	17-MAY-97	31	3	\$16.52
5935013051984XW	16-APR-97	28-OCT-96	170	3	\$17.77
4920013088886	15-JAN-97	18-SEP-96	119	3	\$25.00
1620010607203	10-MAR-97	04-MAR-97	6	3	\$25.81
1620010569668	10-MAR-97	27-FEB-97	11	3	\$28.75
5315010743114LE	13-JUN-97	17-MAY-97	27	3	\$29.60
5365010569670LE	10-MAR-97	04-MAR-97	6	3	\$31.85
1680013970494XW	16-APR-97	12-MAR-96	400	3	\$34.66
5315010732010LE	10-MAR-97	04-MAR-97	6	3	\$41.55
1680011817728XW	16-APR-97	18-OCT-96	180	3	\$41.71
1680013972016XW	16-APR-97	12-MAR-96	400	3	\$44.93
5120010403519	28-MAY-97	23-MAY-97	5	3	\$46.53
4710006760544LG	10-OCT-96	10-JAN-96	274	3	\$47.08
5306010731883LE	10-MAR-97	04-MAR-97	6	3	\$49.11
1680013969100XW	16-APR-97	18-OCT-96	180	3	\$57.04
1630010525340	22-NOV-96	10-SEP-96	73	3	\$62.67
5120001106438	12-MAY-97	26-NOV-96	167	3	\$63.00
1560013965664XW	02-MAY-97	18-OCT-96	196	3	\$66.70
1560013965670XW	16-APR-97	18-OCT-96	180	3	\$80.31

STOCK NUMBER	DATE SHIPPED	DATE PROCESS SAMIS	LEAD TIME	PRIORITY	UNIT PRICE
1620002592828	18-APR-97	16-MAR-97	33	3	\$87.39
1560013969207XW	16-APR-97	18-OCT-96	180	3	\$162.60
2915012665925PR	06-MAR-97	07-NOV-94	850	3	\$197.00
5998012864410XY	04-NOV-96	31-OCT-96	4	3	\$241.05
1620010568922	29-OCT-96	16-OCT-96	13	5	\$6.65
5365010545622LE	12-NOV-96	31-OCT-96	12	5	\$8.65
5915012843181XY	11-JAN-97	07-JAN-97	4	5	\$22.55
1610006781107	04-DEC-96	07-MAY-96	211	5	\$30.11
5315010732011LE	20-DEC-96	06-NOV-96	44	5	\$43.24
1630000326102	29-JAN-97	29-SEP-96	122	5	\$65.62
1560013584791XV	15-MAY-97	25-SEP-96	232	5	\$125.02
5330010551207LE	07-MAR-97	09-JAN-97	57	6	\$1.96
5330010559764LE	15-FEB-97	05-FEB-97	10	6	\$4.41
5306010516032LE	13-FEB-97	29-JAN-97	15	6	\$5.74
5330009823692PQ	11-JUN-97	11-APR-97	61	6	\$10.21
5365010575891LE	30-OCT-96	30-JUL-96	92	6	\$11.01
1630013314868	13-JUN-97	31-DEC-96	164	6	\$11.45
5360010568656LE	21-JAN-97	16-OCT-95	463	6	\$12.41
5305014132023XW	15-OCT-96	14-AUG-95	428	6	\$16.07
1630011862478	03-JUN-97	10-FEB-97	113	6	\$27.73
2810004225432PA	04-OCT-96	02-OCT-96	2	6	\$49.13
5945014071572XW	06-JAN-97	20-APR-95	627	6	\$54.25
3120014178527XW	28-FEB-97	06-DEC-95	450	6	\$60.41
2840005907205RW	15-MAR-97	21-NOV-96	114	6	\$63.87
3120003565718LE	03-OCT-96	27-AUG-96	37	6	\$72.54
5315010753006LE	20-DEC-96	22-APR-96	242	6	\$78.21
1630007551334LE	12-FEB-97	03-JAN-97	40	6	\$96.14
1560014079001XW	10-DEC-96	20-APR-95	600	6	\$102.85
5315014116282XW	12-NOV-96	03-AUG-95	467	6	\$123.45
4320011405786XV	12-DEC-96	06-DEC-96	6	6	\$135.46
3120011441287LE	05-DEC-96	06-AUG-96	121	6	\$141.01
1620010590516	02-MAY-97	19-JUL-96	287	6	\$145.00
1660011887232FX	11-APR-97	07-APR-97	4	6	\$169.35
5315014117684XW	12-NOV-96	02-AUG-95	468	6	\$176.08
1620000228712	31-DEC-96	28-DEC-96	3	6	\$192.91
5330011822857JF	12-FEB-97	10-FEB-97	2	6	\$207.76
1630009496772	16-MAY-97	05-FEB-97	100	6	\$225.04
1630000314395	15-OCT-96	10-OCT-96	5	12	\$3.58
5340011158971LE	24-APR-97	14-APR-97	10	12	\$9.58
5315013209689LE	26-MAY-97	06-NOV-96	201	12	\$34.22
1660008861410XV	15-FEB-97	06-FEB-97	9	12	\$98.27
1630013325496	26-JUN-97	22-JUL-96	339	13	\$5.79
5365010571089LE	29-MAR-97	24-MAR-97	5	13	\$6.35

STOCK NUMBER	DATE SHIPPED	DATE PROCESS SAMIS	LEAD TIME	PRIORITY	UNIT PRICE
5330010513559LE	26-MAR-97	25-NOV-96	121	13	\$12.33
5330011315010LE	25-NOV-96	06-NOV-96	19	13	\$16.55
3120010592035LE	04-JUN-97	26-MAY-97	9	13	\$20.97
4720001828948	30-DEC-96	01-AUG-96	151	13	\$107.60
1620010736820	11-APR-97	11-MAR-97	31	13	\$244.69
5310010562170LE	20-NOV-96	06-NOV-96	14	15	\$22.69
4710012633378LG	12-NOV-96	07-NOV-96	5	15	\$141.99
1610006513887	10-DEC-96	09-DEC-96	1	2	\$266.85
1620010446149	10-MAR-97	04-MAR-97	6	3	\$276.32
5120011984893	29-OCT-96	29-DEC-94	670	3	\$299.50
5180010649443	02-DEC-96	26-NOV-96	6	3	\$315.59
1560014164296XW	16-APR-97	12-MAR-96	400	3	\$320.52
5306013992411XW	10-DEC-96	11-APR-96	243	3	\$338.52
5306013994964XW	21-NOV-96	11-APR-96	224	3	\$365.97
4710005150330PT	12-MAY-97	29-APR-97	13	3	\$382.18
1680013969210XW	16-APR-97	18-OCT-96	180	3	\$468.50
5306013992413XW	21-NOV-96	11-APR-96	224	3	\$488.70
5120001883652	30-JAN-97	08-APR-96	297	3	\$530.12
1650002265787	21-DEC-96	19-DEC-96	2	3	\$538.00
1730000458175	05-OCT-96	16-SEP-96	19	3	\$551.00
5120012698074	05-JUN-97	29-MAY-97	7	3	\$551.05
1620010736853	22-MAY-97	04-OCT-95	596	3	\$568.80
1560013965667XW	19-MAR-97	18-OCT-96	152	3	\$574.33
1650010134127	28-OCT-96	25-OCT-96	3	3	\$589.17
1560012653848XW	16-APR-97	18-OCT-96	180	3	\$606.34
5821011029078	08-APR-97	13-NOV-96	146	3	\$691.33
2840011911895PR	13-FEB-97	06-FEB-97	7	3	\$694.19
1620012561974	13-JUN-97	17-MAY-97	27	3	\$823.86
5180010405082	30-APR-97	10-DEC-96	141	3	\$925.00
5905012810630LE	06-DEC-96	22-NOV-96	14	5	\$442.02
5998012211301JZ	05-APR-97	22-JAN-97	73	5	\$735.82
1620000094247	01-MAY-97	22-JUL-96	283	6	\$262.93
2620011426461	14-JAN-97	30-SEP-96	106	6	\$269.50
5930010637155ZK	06-APR-97	25-FEB-97	40	6	\$289.54
5340014182236XW	16-APR-97	06-DEC-95	497	6	\$325.33
2995007986598PL	11-OCT-96	09-OCT-96	2	6	\$435.14
4933010688007	10-DEC-96	16-APR-96	238	6	\$445.11
5180010649446	20-DEC-96	16-APR-96	248	6	\$470.18
3110011252570PE	09-FEB-97	17-SEP-96	145	6	\$528.84
3940007630104NM	26-JUN-97	20-DEC-96	188	6	\$554.00
5120011105899	29-OCT-96	10-JAN-95	658	6	\$563.87
5180010399893	01-OCT-96	15-APR-96	169	6	\$593.31
4320010104083	08-OCT-96	30-JUL-96	70	6	\$649.67

STOCK NUMBER	DATE SHIPPED	DATE PROCESS SAMIS	LEAD TIME	PRIORITY	UNIT PRICE
5180010649447	18-DEC-96	16-APR-96	246	6	\$671.68
5895000898010	10-FEB-97	09-OCT-96	124	6	\$678.00
5180010649448	18-DEC-96	16-APR-96	246	6	\$740.01
4320004637715HS	31-OCT-96	19-SEP-96	42	6	\$793.51
5210010653112	27-FEB-97	15-APR-96	318	6	\$800.68
1560013970167XW	21-NOV-96	30-MAY-95	541	6	\$829.01
5821010925211	05-DEC-96	26-AUG-96	101	6	\$901.43
5120008630426	23-JAN-97	26-JUL-95	547	8	\$272.89
5996008803562CX	27-FEB-97	09-SEP-96	171	13	\$340.23
5120003031046	10-DEC-96	02-APR-96	252	13	\$544.74
1650004338592	31-OCT-96	13-FEB-96	261	13	\$749.12
2840012539193RW	04-NOV-96	19-DEC-95	321	2	\$1,227.13
1620010714841	02-JUN-97	23-MAY-96	375	2	\$1,356.00
1650011390177	30-JAN-97	24-JAN-97	6	2	\$1,583.68
5180010819622	02-DEC-96	26-NOV-96	6	3	\$1,004.25
6130010761668BY	13-NOV-96	30-OCT-95	380	3	\$1,033.56
5120004692186	05-MAY-97	26-NOV-96	160	3	\$1,043.18
5998003329317CX	20-DEC-96	04-DEC-96	16	3	\$1,215.03
1670010972204XW	09-JUN-97	15-JAN-97	145	3	\$1,216.33
1560014236026XW	03-DEC-96	18-MAR-96	260	3	\$1,267.31
5836013518459SN	01-JAN-97	26-DEC-96	6	3	\$1,526.14
2840012051304PT	21-OCT-96	17-JAN-96	278	3	\$1,541.00
5998013732835NT	04-NOV-96	22-MAR-95	593	3	\$1,544.00
2840012005337PR	12-MAY-97	09-JUL-96	307	3	\$1,645.00
1660003494060XV	03-OCT-96	12-JUN-95	479	3	\$1,681.00
1650006109123	07-NOV-96	26-AUG-96	73	3	\$1,817.73
2840010152432PL	04-JUN-97	08-APR-96	422	3	\$1,922.91
4810008668212HS	04-NOV-96	11-OCT-96	24	3	\$2,018.45
2925012949823PR	14-MAR-97	20-FEB-97	22	3	\$2,214.73
5220006891768GG	19-DEC-96	10-APR-96	253	6	\$1,202.75
1560014078996XW	12-NOV-96	20-APR-95	572	6	\$1,352.02
2915006551933RW	28-FEB-97	17-DEC-96	73	6	\$1,443.73
5180010530497	02-DEC-96	15-APR-96	231	6	\$1,737.11
5180010348998	08-JAN-97	12-APR-96	271	6	\$1,830.60
2805006749414	17-JAN-97	10-DEC-96	38	6	\$1,847.88
4810002327931HS	26-FEB-97	10-DEC-96	78	6	\$1,852.54
1660003220847BO	07-MAR-97	04-MAR-97	3	6	\$1,884.61
5935012950656YM	06-DEC-96	10-APR-96	240	6	\$2,143.00
6150012344105LG	31-OCT-96	13-DEC-95	323	6	\$2,209.87
5120005110205	21-OCT-96	15-OCT-96	6	13	\$1,176.62
1620010492910	07-NOV-96	07-APR-94	945	13	\$1,456.61
4810006732727YQ	29-MAY-97	06-FEB-97	112	2	\$3,650.80
6130013549306NT	09-APR-97	14-MAR-95	757	2	\$5,506.00

STOCK NUMBER	DATE SHIPPED	DATE PROCESS SAMIS	LEAD TIME	PRIORITY	UNIT PRICE
1650012320561	21-MAY-97	08-OCT-93	1321	2	\$6,921.77
4320000620511HS	24-APR-97	05-JUN-96	323	2	\$7,979.32
1680007899345HS	22-MAY-97	21-OCT-96	213	2	\$8,297.52
5826009859174	12-NOV-96	09-NOV-96	3	3	\$2,586.00
5180013086138WF	24-OCT-96	16-SEP-96	38	3	\$2,888.00
4430011603423	07-OCT-96	02-JAN-96	279	3	\$3,788.00
1660000620301	20-APR-97	04-APR-97	16	3	\$4,263.70
5831005391714	08-NOV-96	11-OCT-96	28	3	\$4,311.92
1630010385126	31-MAY-97	15-APR-97	46	3	\$4,542.38
1005006764059	24-JAN-97	12-DEC-96	43	3	\$4,723.92
1650007302850	03-DEC-96	13-APR-95	600	3	\$6,746.00
3040000110704RX	31-OCT-96	08-MAR-96	237	3	\$7,328.01
1650010586259	02-JUN-97	04-OCT-95	607	3	\$7,666.88
2925011485810PN	26-NOV-96	22-NOV-96	4	5	\$4,494.87
2925008596815RW	24-APR-97	08-APR-97	16	6	\$2,609.02
2840013571941PR	05-FEB-97	09-MAY-95	638	6	\$2,714.06
6130010323966CX	15-JUN-97	12-JUN-97	3	6	\$4,600.80
2915007779017RW	10-JAN-97	20-DEC-96	21	6	\$4,636.32
1560006136501LG	14-MAR-97	04-NOV-96	130	6	\$8,450.16
4810007569892HS	10-OCT-96	22-AUG-96	49	13	\$3,531.23
1660008974306	02-MAY-97	08-APR-97	24	3	\$10,432.44
1610011669359	25-JAN-97	14-MAY-96	256	3	\$13,685.00
1660003434692	09-JAN-97	29-AUG-96	133	3	\$18,344.05
1610008736251	18-DEC-96	12-AUG-96	128	6	\$10,427.24
6610005679306	10-DEC-96	28-NOV-94	743	6	\$12,113.22
1650000657688	16-MAR-97	21-JAN-97	54	6	\$12,940.57
1560008903703XX	08-JAN-97	03-DEC-89	2593	6	\$17,061.76
2840010934592PL	25-OCT-96	11-JUL-96	106	6	\$26,357.64
5180010593758	05-DEC-96	15-APR-96	234	6	\$41,762.33
1650012289276	19-DEC-96	26-SEP-96	84	6	\$44,926.59

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Won Joon Jang, Captain, ROK**7. PERFORMING ORGANIZATION NAMES(S) AND ADDRESS(S)**Air Force Institute of Technology  
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**12b. DISTRIBUTION CODE****13. ABSTRACT (Maximum 200 Words)**

In today's world of declining defense budgets, there is an increasing need for South Korea to ensure they obtain the best dollar value when procuring defense articles. With the increasing financial situation, the purpose of this thesis is to research a surrogate third party firm and determine to what degree South Korea and other foreign military sales customers obtain the best value for their money for follow-on support item procurements.

South Korea has participated in the Parts and Repair Ordering System program since its inception. However, South Korea has received little, if any, feedback regarding lead time and cost performance from the Air Force Security Assistance Command. This study analyzed two variables, lead time and total unit cost, and compared these variables in two procurement systems to discover which one provides the best lead time performance for the total average unit price. The results of this analysis concluded that our surrogate third party firm was faster, though not significantly; however, this came at a high price for follow-on support item procurement.

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Security Assistance, Outsourcing and Privatization, Foreign Military Sales

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